MultiAccess® ACS

Analog Communications Server

MA100-1M

User Guide

MultiTech® Systems

MultiAccess ACS User Guide

MA100-1M

PN S000351D, Version D

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Revisions

Revision Level	*Date*	*Description*
A	07/22/05	Initial release.
B	04/13/06	Added modem sharing and call-back security.
C	07/14/06	Change to single mounting bracket and changed mounting dimension.
D	06/22/07	Manual revised to include software version 1.03.
	05/13/09	Added web link for warranty information.

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Warranty

To read the warranty statement for your product, please visit: http://www.multitech.com.

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Chapter 1 – Product Description & Specifications

Product Description

The MultiAcces ACS single-port communications server provides connectivity to the corporate LAN for telecommuters and mobile users, or to remotely installed equipment, via one integrated V.92/56K modem. MultiAccess' small size makes it ideal for users who need remote access on a limited basis, but don't have room for a larger system or where remote access is needed on a temporary basis for remote diagnostics.

The MultiAccess ACS has two roles (usage), RAS and Modem Sharing.

RAS Solution: The MultiAccess can be used as a dial-in PPP Remote Access Server in a LAN to Client environment. The purpose is to give a remote node (i.e., Microsoft Dail-up Networking clients) IP access to the same subnet and LAN the ACS is installed on. Masquerading (NAT) and LAN to LAN routing (assignment of an entire subnet) are IP networking techniques not supported by the ACS. The supported PPP security protocol (means of communicating user credentials between PPP end points) is PAP only.

Modem Sharing Solution: The modem in the ACS can be a shared resource on your network. Computers with network asscess to the ACS can use Telnet on port 7000 and get direct AT command access to the modem in the ACS, for either outbound or inbound calls. A common way to take advantage of this role is by installing Com Port Redirector Software (i.e., Multi-Tech's MCSI2000 for Windows) on your workstation(s). The redirector adds a virtual com port to the workstation and uses Telnet to map, redirect, the com port to the modem. The redirector and Telnet session replaces the UART based hardware of a PC and serial cable connection normally found in traditional modem installations. A communication program using this virtual com port has its data redirected to and from the modem within the ACS, making the modem appear as if it is directly attached to a communication port on the workstation.

MCSI2000 Utility is provided on the MultiAccess CD and a summary of the parameters are presented in Appendix E.

Modem AT Commands are presented in Appendix F.

For the latest revision of the MultiAccess User Documentation, refer to the Multi-Tech Systems, Inc. Web site: http://www.multitech.com

Features

- One integrated V.92/56K modem
- Supports dial-out for clients on IP networks
- Modem supports V.92/56K dial-out and V.34/33.6K dial-in connections
- Client authentication provided through RADIUS or local database
- Callback security using local database
- Connects to 10/100BaseT Ethernet
- Industry-standard PPP client support
- Web server interface for system configuration and management
- Flash memory on modem and server for easy updates
- Two-year warranty

Package Contents

The MultiAccess package contains:

- One MultiAccess ACS
- One universal power supply with power cord
- One mounting bracket
- Four adhesive-backed rubber feet for table-top mounting
- One Quick Start Guide
- One product CD

Handling Precautions

All Devices must be handled with certain precautions to avoid damage due to the accumulation of static charge. Although input protection circuitry has been incorporated into the Devices to minimize the effect of this static buildup, proper precautions should be taken to avoid exposure to electrostatic discharge during handling and mounting.

LED Indicators

Name	Description
TD	Transmit Data – Lit when transmitting data
RD	Receive Data – Lit when receiving data
CD	Carrier Detect – Lit when a valid carrier signal is detected
LNK	Link – Lit when network data connection has been established.
ACT	Activity – Lit when network data is being transmitted or received.
PWR	Power – Flashes as a heart beat when unit is functioning normally. If the processor is locked up, this LED is on all the time.

Product Specifications

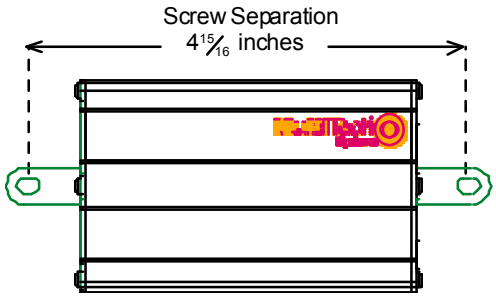
Category	Description
LAN Port	10/100Baset Ethernet
WAN Port	V.92/56K modem
Data Rates	V.92/56K downloads and 48K uploads speeds from V.92 servers; V.90/56K downloads from V.90/K56flex servers; 33.6K bps transfers with other servers.
Standards	Data: V.92, V.90, enhanced V.34 & below
	Error Correction: V.42
	Data Compression: V.44, MNP® Class 5; V.42bis
System Management	Web based - HTTP
Security	Local database or RADIUS support
Power Usage	Typical – 1.6W (175mA @ 9VDC) Maximum – 2.2W (225mA @ 9.9VDC)
Power Supply	100-240VAC; 50/60Hz universal input or 120VAC; 60Hz
Operating Temperature	32° to +120°F (0° to 50°C); humidity range 20-90% (non-condensing)
Storage Temperature	-40°C to +85°C
Physical Dimensions	4.3” w x 2.4” h x 0.94” d; 4.5 oz. 11 cm x 6.1 cm x 2.4 cm; .14K g
Certifications	CE Mark EMC: FCC Part 15 Class B, EN55022, EN55024 Safety: UL 60950, En60950 Telecom: 47CFR Part 68, CS03, TBR21 Other countries also included

Chapter 2 – Installation

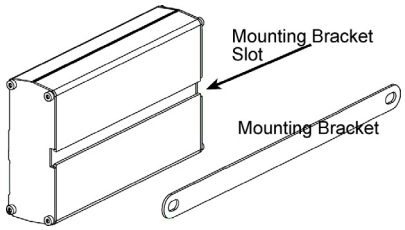
Attaching the MultiAccess ACS to a Fixed Location

The MultiAccess is design to be used on the desktop or to be panel-mounted. To attach the bracket for panel-mounting, following these steps:

1. Typically, the MultiAccess is mounted against a flat surface with two mounting screws. Drill the mounting holes at the desired location. The mounting holes must separated by 4 15/16 inches center-to-center.



2. To attach the bracket to the MultiAccess, slide the mounting bracket into the corresponding slots on the back of the MultiAccess chassis.



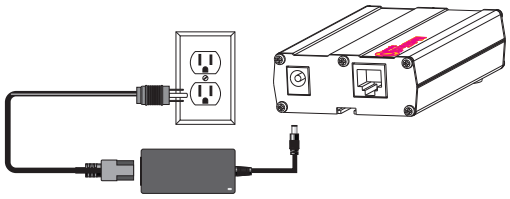
3. Attach the adapter to the surface with two screws.

MultiAccess ACS Connections

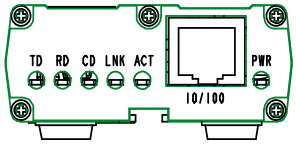
The MT100-1M is supplied power through an external power supply.

1. Plug the DC power transformer into the power outlet or power strip. Secure the other end to the PWR on your MultiAccess. The DC power transformer is included with your MultiAccess.

   Caution: Use only the DC power transform supplied with the MA100-1M. Use of any other transformer voids the warranty and can damage the unit.

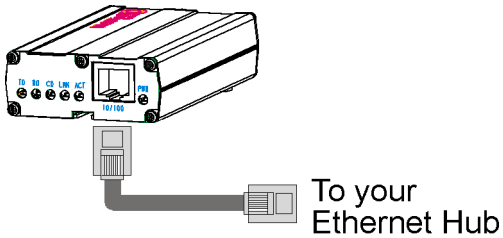


2. After power is applied, there is a 4-second delay before the PWR LED comes on. In normal operation, the PWR LED will be flashing.



   When you apply power, the MA100-1M performs a diagnostic self-test. The PWR indicator flashes as a heart beat indicating that the processor is functioning correctly. If the PWR indicator does not come on, check that the power supply is solidly connected and that the AC outlet is live. If the PWR indicator flashes as a heart beat, then comes on solid, this indicates a malfunction within the unit.

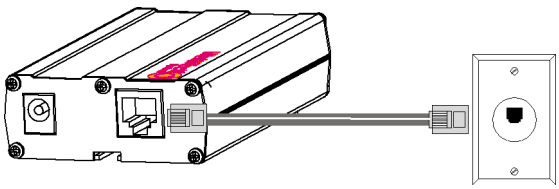
3. Plug one end of your RJ45 Ethernet cable into the MA100-1M's Ethernet jack and the other end into your network Ethernet hub. This Ethernet cable is not included with your MA100-1M unit.



   Caution: Before connecting to the Ethernet Network, make sure that the network to which you are connecting the MA100-1M is not a 192.168.2.x subnet. Because the MA100-1M's factory default IP address is 192.168.2.1, connecting it to a network that has a different Device at that same IP address would cause data interference.

   If it is a 192.168.2.x subnet, connect from the Administrative PC to the MA100-1M using an RJ45 crossover cable until the MA100-1M's IP address has been configured. Thereafter, connect the MA100-1M into the network with an ordinary RJ45 cable.

4. Plug one end of a phone cable into the telephone wall jack and the other end into the LINE jack on the MA100-1M.



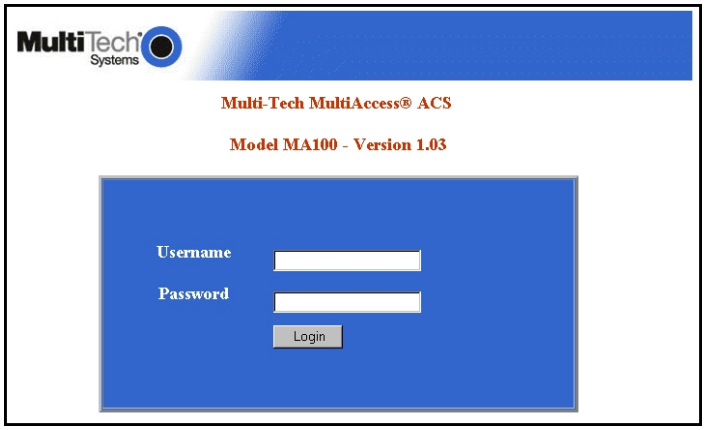
Chapter 3 – Configuring Your MultiAccess ACS

Setting Admin PC to Startup IP Address

1. Connect a PC to your network. Record the original PC's IP address before you change it.
2. Set the PC IP address to **192.168.2.x** subnet (using any address excluding 192.168.2.1).

Logging In

1. Bring up a Web browser on your PC. At the browser's address line, type the default address of the MA100-1M: http://192.168.2.1 and press **Enter**.
2. The **Login** screen will appear.



At this point you can be assured that the MA100-1M is connected to the network.

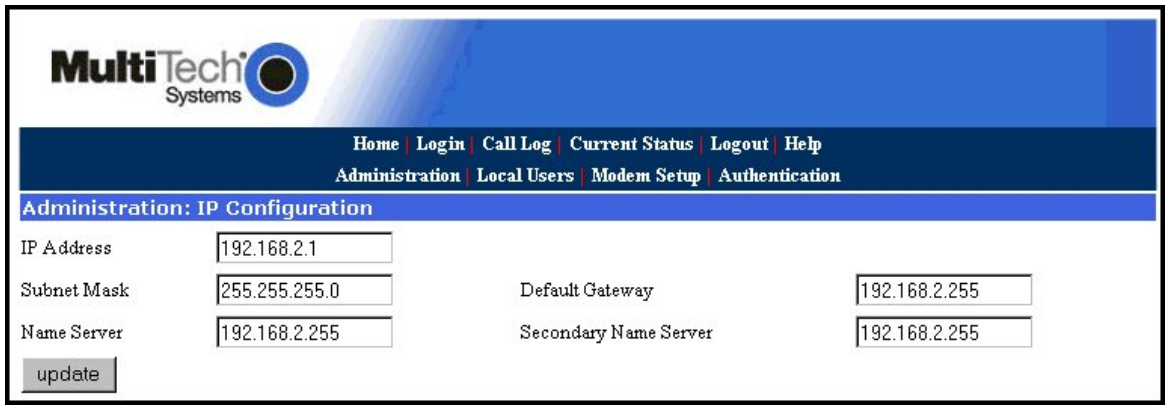
If the **Login** screen does not appear, see item #1, "What if I can't see the web page for my MA100-1M?" in *Chapter 5: **Troubleshooting***.

3. At the **Login** screen, enter **admin** (all lower case) in the Username field.
4. Enter **admin** (all lower case) in the Password field.
5. Click the **Login** button. The **Home** screen will appear. From this screen, you can access all of the MA100-1M software screens.

MultiTech Systems
Home | Login | Call Log | Current Status | Logout | Help
Administration | Local Users | Modem Setup | Authentication
Multi-Tech MultiAccess® ACS
Model MA100 - Version 1.03
2205 Woodale Drive
Mounds View, MN 55112
United States
TEL: (763) 785-3500 or (800) 328-9717
FAX: (763) 785-9874
Tech Support: (800) 972-2439
Web Site: www.multitech.com
FTP Site: ftp.multitech.com
Tech Support:tsupport@multitech.com
MultiAccess® ACS
Internet

Setting MA100-1M IP Addresses

1. In the MA100-1M **Administration** screen, go to the **IP Configuration** fields.



2. Fill in the IP information that applies to your MA100-1M unit. The fields for "IP Address," "Subnet Mask," "Default Gateway" and "Name Server" are required. A "Secondary Name Server" is optional.
3. Click **Update**. After the **Update** button has been clicked, it takes 5 seconds for the MA100-1M to update the addresses.

Resetting Admin PC to Its Original IP Address

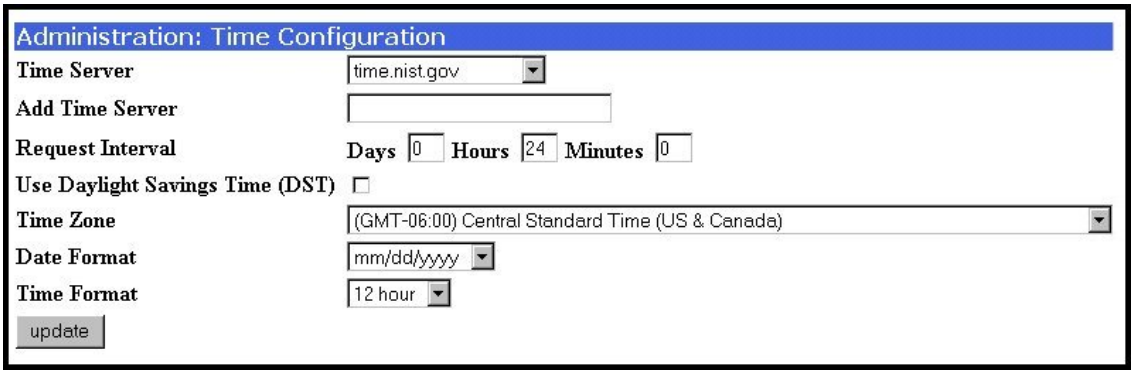
In Setting the Admin PC to the network number of the MultiAccess, you recorded the original IP address of the administrator's PC and then reset it to the IP address required to allow communication with the MA100-1M unit. You may now set the IP address of the administrator's PC back to its original value or to any other value that will allow you to communicate with the MA100-1M at its new IP address.

Logging In Again

Having reset the IP address of the administrator's PC, you must log into the MA100-1M software again with the MA100-1M's new IP address. Go to the **Login** screen, enter **admin** as User Name and **admin** as Password.

Time Configuration

1. In the MultiAccess **Administration** screen, go to the **Time Configuration** fields.

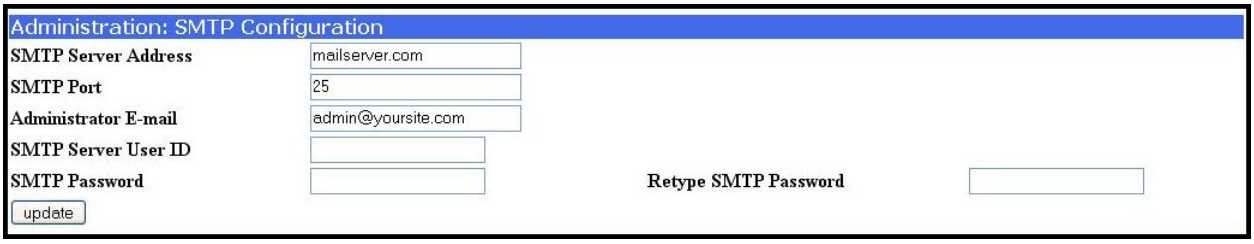


2. In the **Time Server** window, select from the three time server URLs. The default is time.nist.gov. The Time Server is a substitute for a real-time clock in the MultiAccess.

   If you would like to add your own time server, you can enter the URL or IP address of your time server in the **Add Time Server** window.
3. In the **Request Interval** window, select the **Days, Hours,** and **Minutes** that the MultiAccess will update its clock from the time server.
4. If you are in daylight savings time, check the **Use Daylight Savings Time (DST)** box.
5. In the **Time Zone, Date Format,** and **Time Format** windows, choose the options for your time zone.
6. Click the **update** button to change to your new parameters.

Setting Up the Mail Server

1. From the Administration screen, go to the SMTP Configuration fields.



2. Enter the mail server address in the **SMTP Server Address** window (e.g., mail.multitech.com or IP address).
3. Enter the SMTP Port (usually 25) that is used as the SMTP Server.
4. Enter the E-mail address of the administrator in the **Administrator E-mail** window.
5. If the SMTP Server requires a User ID, enter the ID in the **SMTP Server User ID** window.
6. If the SMTP Server requires a password, enter the password in the **SMTP Password** window.
7. If you enter a password, retype the identical password in the **Retype SMTP Password** window.
8. Click on **Update**. At this point the MA100-1M will send the Administrator an email saying that the mail server address has been updated.

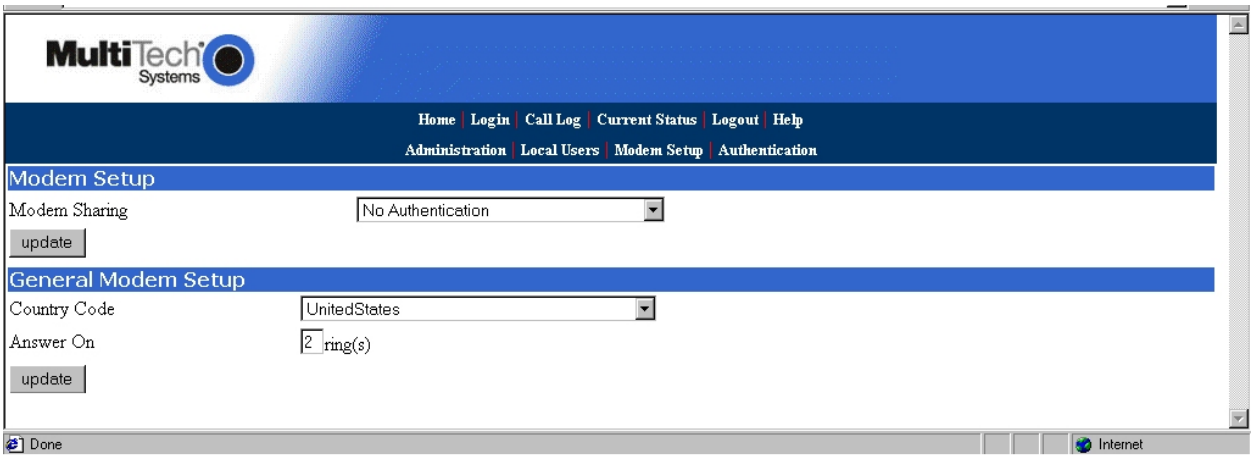
Modem Setup

The Modem Setup menu group defines the Modem Sharing behavior and the General Modem Setup Group defines the Country Code and number of rings before auto answer.

If you are using your MultiAccess for dial-in PPP access (RAS solution), you do not have to modify Modem sharing, but, you have to select the Country Code. If you are using your MultiAccess for dial-out, you will have to select one of the Modem Sharing options and select the Country Code.

With any of the Modem Sharing options, the TCP port number used to access the modem is 7000. Modem Sharing with authentication means a login prompt will be issued to the socket when it is opened. Who (what) ever opened the socket must provide appropriate credentials before access is given to the modem. If RAW is also selected – support for RFC 2217 (com port control vial Telnet) will be disabled.

1. If you are using your MultiAccess for dial-in PPP access (RAS), click on the **Country Code** down arrow and choose your country/region. Click on the **update** button to save your selection.



If you are using your MultiAccess for dial-out, you will have to click on the **Modem Sharing** down arrow and choose one of the **Modem Sharing** options.

Caution: Modem sharing is accomplished by implementing a Telnet interface to the MultiAccess modem. Secure the access to the port via a firewall or IP filter settings to prevent unauthorized use of your modem resource.

No Authentication. Immediate access is given to the modem.

Local Authentication. A valid set of credentials, defined in the Local User data base, is required before access is granted.

Radius Authentication. A valid set of credentials, defined in the Radius User data base, is required before access is granted.

Raw Mode with No Authentication. User data is treated “as is”, without interpretation, and no authentication is required.

Raw Mode with Local Authentication. User data is treated “as is”, without interpretation, and a valid set of credentials, defined in the Local User data base, is required before access is granted.

Raw Mode with Radius Authentication. User data is treated “as is”, without interpretation, and a set of credentials, defined in the Radius User data base, is required before access is granted.

2. Select your **Country Code** by clicking on the down arrow and choose your country/region.
3. If the modem is being used for in-bound calls, select the number of ring(s) for auto answer.
4. Click **Update**

Setting Authentication

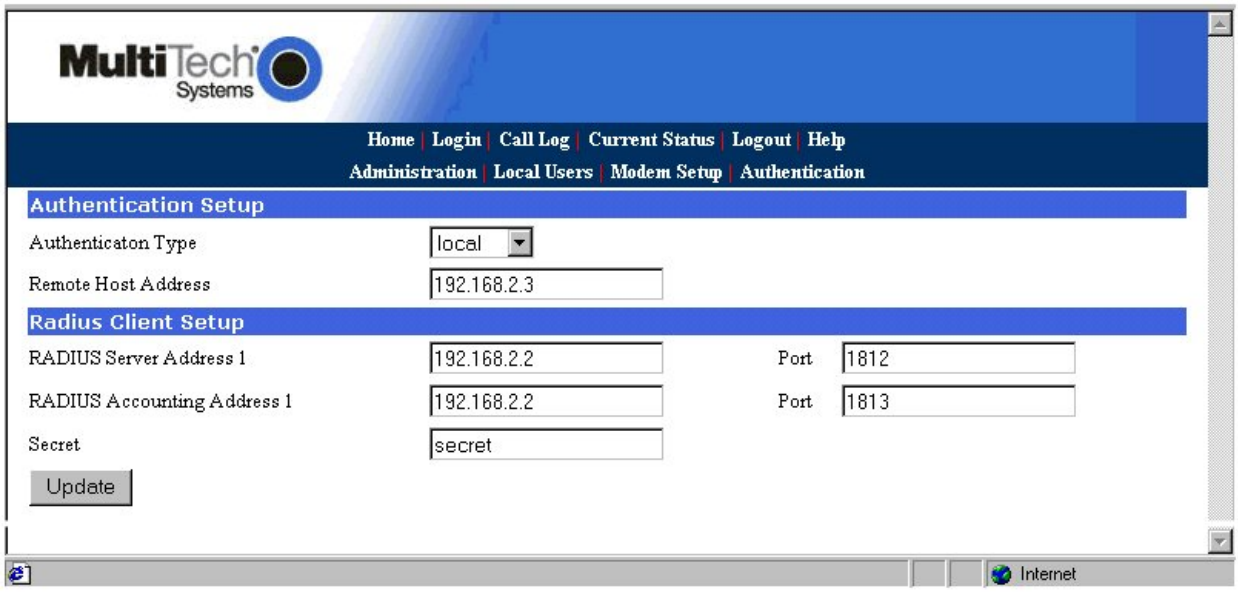
Authentication Type option defines where the database of user credentials reside. Local Authentication refers to the Local User Database on the MultiAccess. Radius Authentication refers to a user database controlled by a Radius Server outside the MultiAccess.

If a Radius Server is used for authentication, then the server has to be configured to receive requests from the MA100-1M.

For RAS calls, dial-in PPP, a second static IP address is needed in the Remote Host Address field. This address is for the dial-in user, PPP server. This address needs to be on the same subnet, network number as that of the MultiAccess.

Remote Host Address is not used if the modem sharing is set for authentication..

Radius Client Setup points to the Radius Server when the Authentication is Radius.



Authentication

1. In the Authentication Type, if your database for user credentials reside in the Local User Database on the MultiAccess, then accept the default – local.

   If your user database resides on a Radius Server outside the MultiAccess, then click on the **down arrow** and choose **radius**.

2. For RAS calls, enter a static IP Address in the Remote Host Address window which will be assigned to the dial-in user. This Remote Host Address has to match the network number of the MultiAccess.

RADIUS

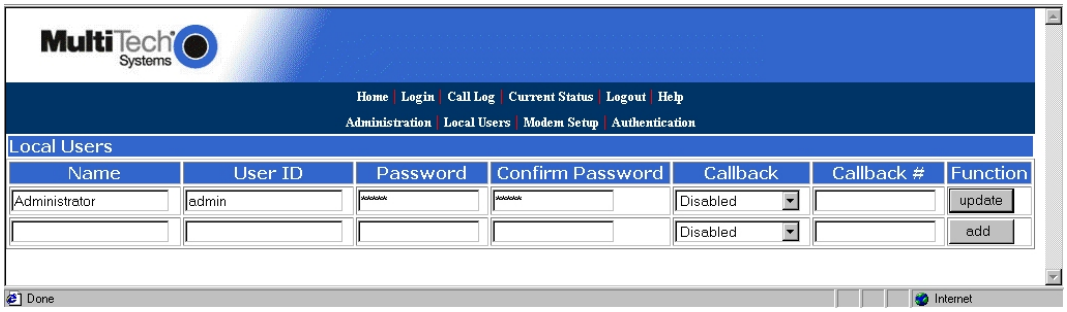
1. If you are setting up MultiAccess to use Radius authentication, then enter the IP address of the primary RADIUS Server in the **RADIUS Server Address 1** window.
2. Enter the **port** number (usually port 1812) for the RADIUS Server in the top Port window.
3. Enter the IP address of the Radius Accounting server in the **RADIUS Accounting Address 1** window.
4. Enter the **port** number (usually port 1813) for the Radius Accounting Server in the bottom Port window.
5. Enter the **Secret** of the Radius Server that you are communicating with. The Secret has to be identical to the one used by your Radius Server and is limited to 14 alphanumeric characters.
6. Click on the Update button to save your port configuration.

Setting Up Local Users

The administrator builds the Local Users data base defining the Name field, recording the User ID, Password entries, and callback method. The administrator account has both administration of the MA100-1M and dial-in rights. The user accounts only have rights to use the modem. The remote user enters their user ID and password during the dial-in session.

For Local Authentication, go to the **Local Users** screen.

Note: The first row is for the "Administrator" function. No matter what values are used for the **Name**, **User ID** and **Password** fields, the first row will still apply to the person doing the Administrator function for the MA100-1M. The Administrator is the party privileged to configure the MA100-1M.



Note: Callback Security can be implemented in two ways: 1) a fixed telephone number by choosing Admin specified in the Callback window. 2) A variable telephone number by choosing User specified in the Callback window.

Administrator Row:

1. In the "Administrator" row of the **Local Users** screen, enter the Name and User ID to be used for the MA100-1M administrator (it need not be literally "Administrator").
2. In the Password window, enter an alphanumeric password. Passwords can be as long as 21 characters, and are case-sensitive.
3. In the Confirm Password window, enter the identical alphanumeric password.
4. If the administrator is going to enable the Callback Security option, click on the **Callback** down arrow and choose the callback method. A fixed phone number is **Admin specified** or variable phone number is **User specified**.
   If the Callback Security option is enabled and **Admin specified** is selected, then enter your fixed callback telephone number in the **Callback #** window.
   If the **Callback Security** option is enabled and **User Specified** is selected, you do not enter a telephone number in the **Callback #** window. You enter the callback telephone number during the dial-in process.
5. Click on **Update** in the "Administrator" row. At this point, a **Login** screen will appear and you will be asked to log in again. Log in using the administrator's User ID (as listed in the "User ID" column) and the administrator's current password.
   Caution: If you change the admin password, you must be sure you remember you new password.

Users Row:

1. In the first blank row, enter the **Name** and **User ID** of your local user.
2. In the **Password** window, enter an alphanumeric password. Passwords can be as long as 21 characters, and are case-sensitive.
3. In the **Confirm Password** window, enter the identical alphanumeric password.
4. If you are going to enable the Callback Security option for a remote user, click on the **Callback** down arrow and choose the callback method. A fixed phone number is **Admin specified** or a variable phone number is **User specified**. For example, if a traveling sales person needs to be called back at their current location, they will provide the callback telephone number during the dial-in process.
   If the **Callback Security** option is enabled and **Admin specified** is selected, then enter their fixed callback telephone number in the **Callback #** window.
   If the **Callback Security** option is enabled and **User specified** is selected, you **do not** enter a telephone in the **callback #** window. The remote user enters the callback number during the dial-in process.
5. Click the **add** button to include this local user in the data base.
6. Repeat the User Row steps for each user you want to add to your local user data base.

Chapter 4 – Software

In this chapter, we present the screens of the MultiAccess ACS software. We describe each field in each screen and some of the command buttons. (We do not describe command buttons that have functions that would be readily understood by users of Windows software. Examples of such self-evident functions include buttons like “OK,” “Cancel,” “Next,” etc.)

Home Screen

The MultiAccess **Home** screen offers access to all other MultiAccess software screens.

MultiTech Systems
Home | Login | Call Log | Current Status | Logout | Help
Administration | Local Users | Modem Setup | Authentication
Multi-Tech MultiAccess® ACS
Model MA100 - Version 1.03
2205 Woodale Drive
Mounds View, MN 55112
United States
TEL: (763) 785-3500 or (800) 328-9717
FAX: (763) 785-9874
Tech Support: (800) 972-2439
Web Site: www.multitech.com
FTP Site: ftp.multitech.com
Tech Support:tsupport@multitech.com
MultiAccess® ACS
Internet

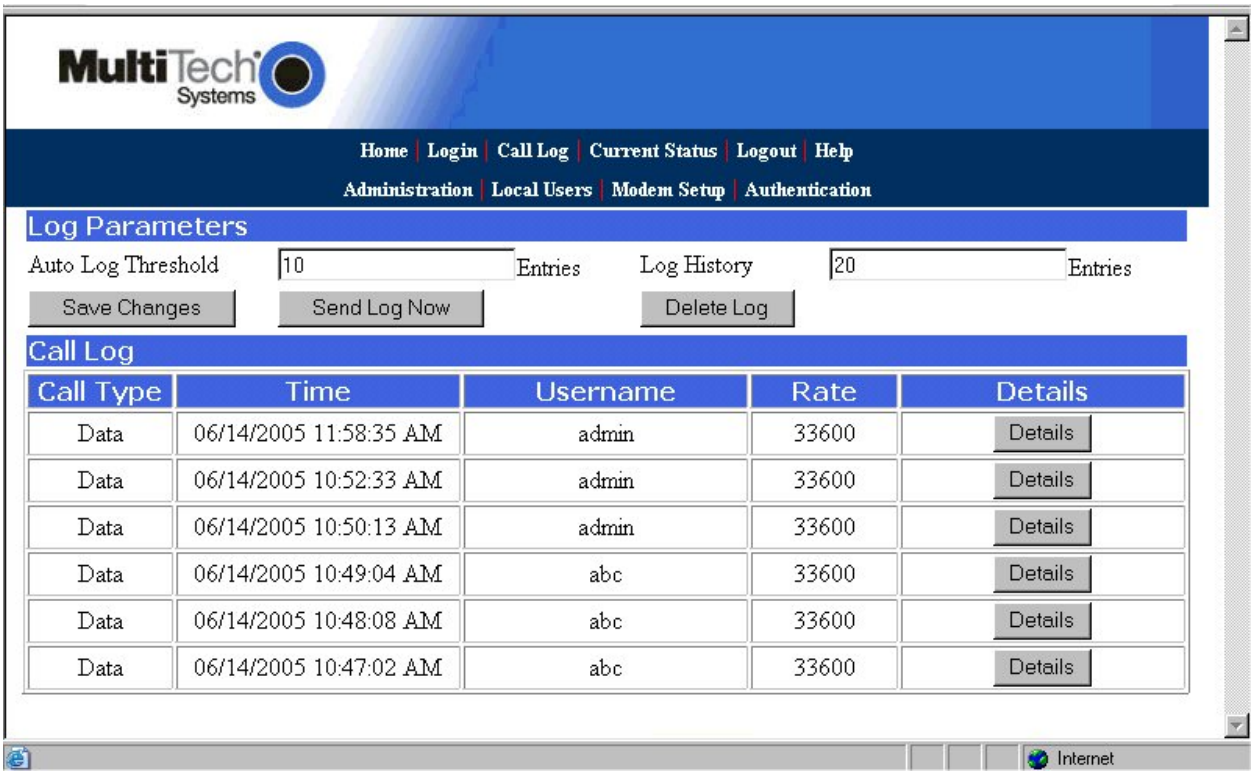
Login Screen

The MultiAccess **Login** screen is the primary security Device for the Server software.

The MultiAccess has a default setting that allows use of “admin” as both the User Name and the Password at initial startup. After you have begun configuring your MultiAccess, you should change the password in the **Local Users** screen for the administrator account described later in this chapter.

Call Log Screen

The Call Log screen displays the parameters you can set for the Call Log entries and displays a call log entry for each call. The Log Parameters define the threshold number of entries and the number of entries retained in the log history. The Call Log summarizes each call and the Details button displays an in-depth look at the call from the individual initiating the call, when the call was connected, duration of the call, transmit and receive baud rates, to authentication status.


MultiTech Systems
Home | Login | Call Log | Current Status | Logout | Help
Administration | Local Users | Modem Setup | Authentication
Log Parameters
Auto Log Threshold 10 Entries
Log History 20 Entries
Save Changes
Send Log Now
Delete Log
Call Log
Call Type | Time | Username | Rate | Details
Data | 06/14/2005 11:58:35 AM | admin | 33600 | Details
Data | 06/14/2005 10:52:33 AM | admin | 33600 | Details
Data | 06/14/2005 10:50:13 AM | admin | 33600 | Details
Data | 06/14/2005 10:49:04 AM | abc | 33600 | Details
Data | 06/14/2005 10:48:08 AM | abc | 33600 | Details
Data | 06/14/2005 10:47:02 AM | abc | 33600 | Details
Internet

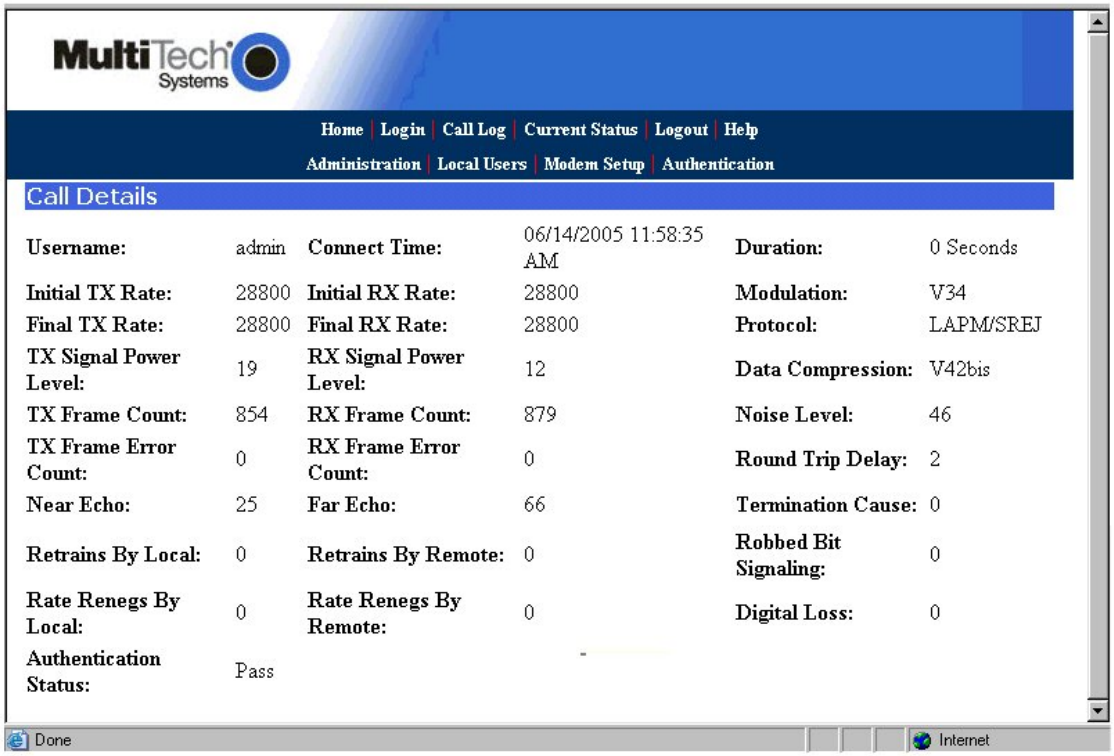
Log Parameters Field Definitions		
Column	**Values**	**Description**
Auto Log Threshold	Numeric 1 to 20 entries	The Auto Log Threshold is limited to 20 logs. The threshold is limited by the memory in the MultiAccess.
Log History	Numeric 1 to 20 entries	The Log History Entries defines how many Call Log entries are stored. The maximum number of Log History entries is limited by the memory in the MultiAccess and that limit is 20 entries.
Save Changes (button)		Click the Save Changes button save the threshold and history entries.
Send Log Now (button)		Click the Send Log Now button to
Delete Log (button)		Click the Delete Log button to remove Call Log entries

Call Log

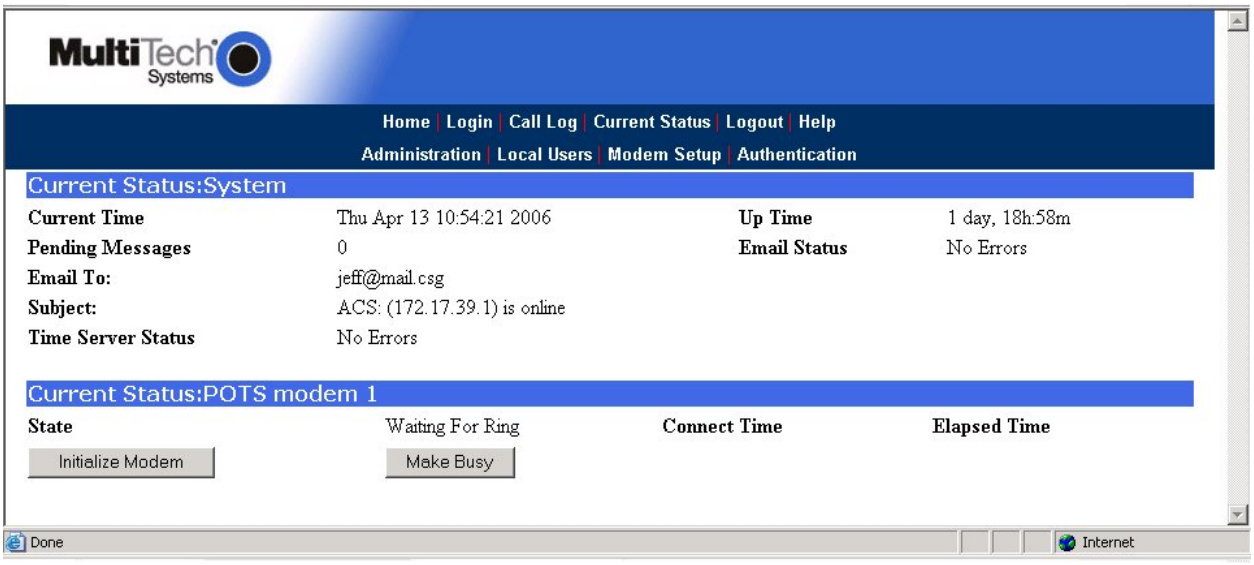
Call Log Field Definitions		
Column	**Values**	**Description**
Call Type	Data	Data call is the only type of call supported by MultiAccess.
Time	mm/dd/yyyy	Time that call was sent or received.
Username	alphanumeric	The name of the user generating or receiving the call.
Rate	33,600; 31,200; 28,800; 26,400; 24,000; 21,600; 19,200; 16,800; 14,400; 12,000; 9600; 7200; 4800; 2400; 1200; 0-300 bps	The data call transmission speed in bits per second at which the current call occurred.
Details		The Details button displays the details of that call.

Call Details

The Call Details screen displays the details of the call when the Details button was clicked for the call displayed in the Call Log. The Call Details present an in-depth view of the call from the individual initiating the call to the time it was connected, duration of the call, transmit and receive baud rates, authentication status, and much more.



Current Status Screen



Current Status Field Definitions		
Field Name	**Values**	**Description**
System group		
Current Time	weekday, mo, dd hh:mm:ss yyyy	The present time of day.
Pending Messages	numeric	Emails sent to the administrator that have not been opened. These can include debug log messages, mail server change notifiction message (relating to the "SMTP Server Address" field of **Administration** screen).
Email To:	Alphanumeric in email name format	The email address has to be entered in proper user@domain format.
Subject:	Alphanumeric	Title of the last pending or sent email.
Time Server Status	Initializing, No Errors, SNTP Error: *type*	The MultiAccess synchronizes its call time stamps to an Internet source, usually a government standards site. It will attempt contact with the standards web site 5 times in 20 seconds. If contact fails, it will try 5 times again 5 minutes later. If contact succeeds, the MultiAccess will update its stamping time periodically per an interval set in the **Administration** screen.

Current Status Field Definitions (cont'd)		
Field Name	**Values**	**Description**
System group		
Up Time	*x* days *yy* hours: *zz* minutes	Operation time since last reboot.
Email Status	No Errors, Bad MailServer Address, Mail Server Connect Failed, SMTP Invalid Response, SMTP Client Timeout	Indicates whether the MultiAccess's email transmissions, both calls and administrative messages, are proceeding with or without errors.
POTS Modem1 group		
State	Waiting for Ring, Initializing Modem, Waiting for Connect, User login getting Call info	Indicates the modem's current operating condition.
Connect Time	mm/dd/yyyy, hh:mm:ss	For the current call, the date and time at which the connection began.
Elapsed Time	numeric	The duration of the current call in seconds.
Initialize Modem (button)		Initializes the modem, clearing a busied-out state. This can only be done by a user with administrative rights.
Make Busy (button)		Imposes a busied state on the modem. This can only be done by a user with administrative rights.
Reset (button)		Click on this button to reset the unit to factory defaults.

Logout Option

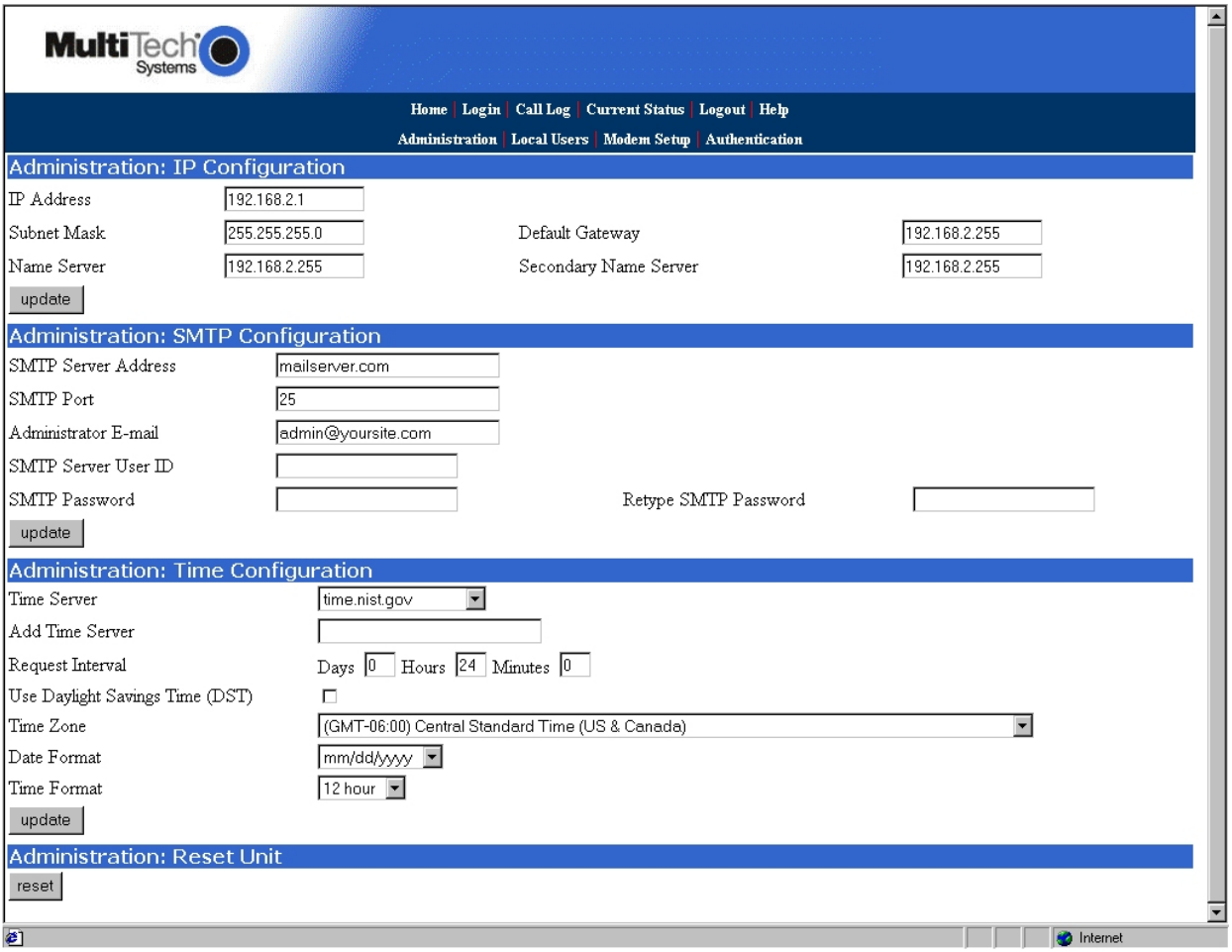
When you click on Logout in the **Home** screen, you will be logged out of the MultiAccess software. The **Login** screen will appear to allow access to re-enter the program.

Help Screen

Online Help has not yet been implemented.

Administration Screen

The Administration Screen sets up the network addressing of the MultiAccess, communication with the SMTP name server, and defines the time stamp for the MultiAccess.

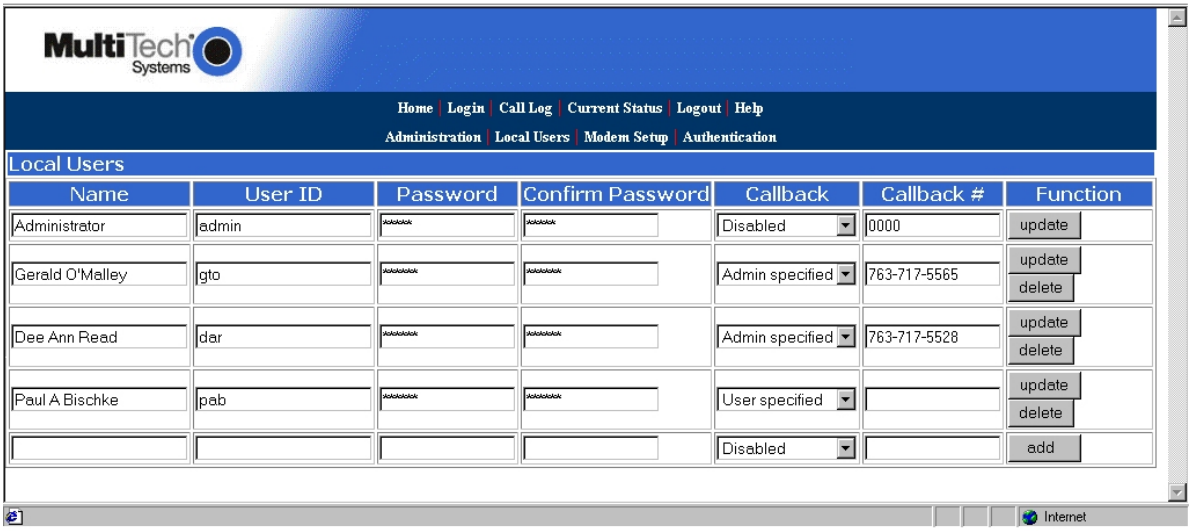


Administration Screen Field Definitions		
Field Name	**Values**	**Description**
IP Configuration Fields		
IP Address	n.n.n.n	The IP address of the MultiAccess.
Subnet Mask	n.n.n.n	This subnet mask is the subnet for the network to which the MultiAccess is connected. A subnet mask is used in conjunction with the IP address to determine if a data destination is on the same immediate network or not. The default value, often used, is 255.255.255.0.
Name Server		The IP address of a local DNS server.
Default Gateway	n.n.n.n	Address used to route calls out of the immediate network.
Secondary Name Server	n.n.n.n	The IP address of a backup DNS server, which is typically at a separate location.

Administration Screen Field Definitions		
Field Name	**Values**	**Description**
IP Configuration Fields		
Update (button)		Click on this button to make changes to IP Configuration fields take effect.
SMTP Configuration Fields		
SMTP Server Address		Domain name or IP address for mail server (SMTP must be supported on mail server).
SMTP Port	Numeric	The default SMTP Port number is 25.
Administrator E-mail	Alphanumeric in email name format	The administrator's email address. This address has to be entered in proper user@domain format
SMTP Server User ID	Alphanumeric	An additional security identifier for the mail server, that if required by the mail server is typically a short unique name or location of the server.
SMTP Password	Alphanumeric	Security code for the SMTP Server.
Retype SMTP Password	Alphanumeric	After the SMTP Password is entered above, an exactly matching entry must be made here to validate that password
Update (button)		Click on this button after changes have been made to the SMTP Server's configuration before the change take effect.
Time Configuration Fields		
Time Server	URL	Location of time-tracking computer that supports SMTP. This server is the functional substitute for a real-time clock in the MultiAccess.
Add Time Server	URL	Used to add a user-supplied time server.
Request Interval		This value (to be set by user) indicates how often the MultiAccess will update its clock from the Time Server.
Use Daylight Savings Time	Check box	New 2007 dates. Start DST second Sunday in April. End 1st Sunday in Nov.
Time Zone	alphanumeric	Indicates the time zone in which the MultiAccess is located.
Date Format	Numeric	Click on the down arrow to select the date format.
Time Format	Alphanumeric	Click on the down arrow to select the time format.
Update (button)		Click on this button to make changes to Time Configuration settings take effect.
Reset (button)		Soft reset of the software.

Local Users Data Base Screen

The administrator builds the Local Users data base defining the Name field, recording the User ID, Password entries, and callback method. The administrator account has both administration of the MA100-1M and dial-in and dial-out rights. The user accounts have dial-in and dial-out rights to use the modem. The remote user enters their user ID and password at the beginning of the dial-in session.



Local Users Field Definitions		
Field Name	**Values**	**Description**
Name	21 Alphanumeric characters max	The Name field is an unique identifier that is used for ease of administration and is not used for authentication. For each user entry, this column shows the user's name as you entered it.
User ID	21 Alphanumeric Characters max	The administrator enters the credentials, user ID, that the remote user is going to enter at his/her login prompt.
Password	21 Alphanumeric characters max	The administrator enters the credentials, password, that the remote user is going to enter at his/her login prompt.
Confirm Password	Alphanumeric	The confirm password is the identical password that you just entered in the Password window.
Callback	Disabled, User specified, Admin specified	User specified allows a remote user to enter a callback telephone number during a dial-in session and be able to change this number at any time. Admin specified allows a fixed telephone number to be entered that is associated with a remote location.
Callback #	Any printable character	This is the telephone number that the MultiAccess uses to call the remote user. This telephone number can be up to 39 digits.
Function – Update (button)		Click the Update button to after you have changed a user's record.
Function – Delete (button)		Click the Delete button to remove a user record. Be aware that the removal of the user record is not confirmed.
Function – Add (button)		Click the Add button when you have entered a new user into the Local Users data base.

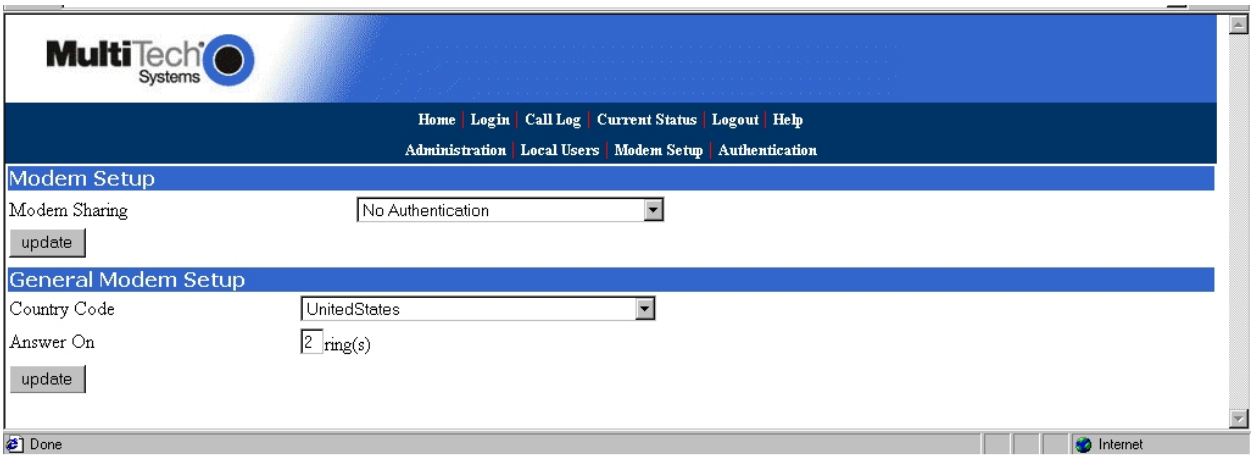
Modem Setup

The Modem Setup screen defines the Modem Sharing behavior and general modem parameters, Country Code and number of rings before auto answer.

Prior to software release 1.03, the ports were configured for either RAS or modem sharing, for which they were then dedicated to just that role. Now, with software release 1.03, the ports can be configured for both roles, alleviating the need for administrator intervention when either role is desired.

The TCP port number to access the modem is 7000. The Modem Sharing method can be with or without an authentication process. Modem Sharing with authentication means a login prompt will be issued into the socket, to the user, when it is opened. Who, what, opens the socket must provide the appropriate credentials before access is given to the modem. The data base of user's names and passwords the MultiAccess will check against can be one of two choices. A local data base, defined within the MultiAccess, or a Radius data base, defined in a Radius server, external to the MultiAccess.

The type of Telnet connection, mode, can be "Raw" or not Raw. A Raw Telnet connection is one that does not respond to or use Telnet and RFC 2217 escape sequences, flags. When Raw is not used, packets of FF will not be interpreted as escape flags. The excape routine includes a process of removing and replacing escape flags and subsequent characters normally intended for command and control function between Telnet hosts, RFC 2217 com port control via Telnet.



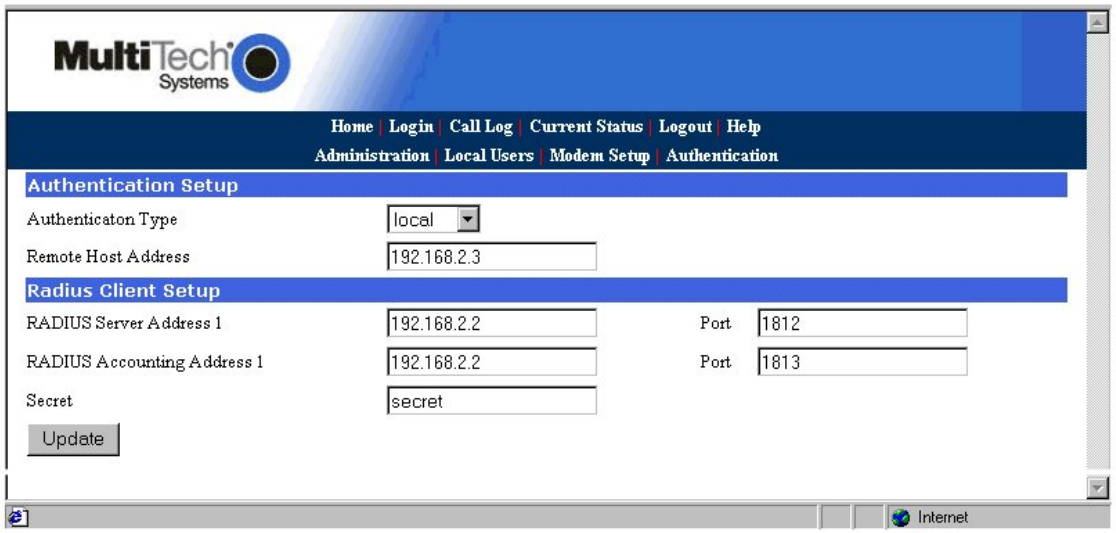
Modem Setup Screen Field Definitions		
Field Name	**Values**	**Description**
Modem Sharing	Modem Sharing with no, local, or radius Authentication,and Modem Sharing- Raw Mode with no, local or radius Authentication	The type of PPP session is standard PAP authentication with IP as the network protocol. No Authentication – Immediate access is granted to the modem. Local Authentication – A valid set of credentials, defined in the Local User data base, is required before access is granted. Radius Authentication – A valid set of credentials, defined in the Radius User data base, is required before access is granted. Raw is the type of telnet socket used to access the shared modem.
Country Code	Alphabetical	The Country Code configures the modem for the country that it is operating in.
Answer On	Numeric	The number of rings before the maodem answers is defaulted to two rings. You can change the number of rings from zero to 255 rings.
Update (button)		Click this button to update the configuration.

Authentication Screen

If the authentication method is Radius, then the IP address of the Radius server and Radius Accounting Server have to be entered and the user credentials are handled by the Radius server.

If the authentication method is local, the Local User Database defines the user credentials.

For RAS calls, dial-in PPP, a second static IP address is needed in the Remote Host Address field. This address is for the dial-in user, PPP peer. This address needs to be on the same subnet, network number, as that of the MultiAccess.



Authentication Screen Field Definitions		
Field Name	**Values**	**Description**
Authentication Setup Fields		
Authentication Type	local or radius	Local Authentication refers to the Local User database on the MultiAccess. Radius is a network specific protocol used to communicate authentication requests between the authentication server and Radius client. User credentials are stored within the Radius server. The MultiAccess is a Radius client.
Remote Host Address	n.n.n.n	This is the IP address the MultiAccess will assign to the remote node, PPP client, if one is not dictated by the Radius server which is included in the authentication accept packet issued by the Radius server. This address should be on the same network number as that of the MultiAccess.
Radius Client Setup Fields		
RADIUS Server Address 1	n.n.n.n	IP address of the Radius Server providing remote user verification.
Port	numeric	The UDP port number (ususally 1812) is used to communicate with the Radius Server. The Radius server has to listen on the same set of UDP ports that the Radius client, MultiAccess is using.
RADIUS Accounting Address 1	n.n.n.n	IP address of the Radius Accounting host. Radius accounting is a process that starts after successful Radius authentication. The MultiAccess sends an accounting start packet to the accounting server. When the user disconnects, the MultiAccess sends an accounting stop packet to the accounting server. Radius accounting summaries the time and date, duration, POTS port connected and IP address given to the user for that call. Radius accounting does not track the amount or type of data or places the user has been.
Port	Numeric	The UDP port number (usually 1813) is used to communicate with the Radius Accounting host. The host has to listen on the same set of UDP ports that the Radius client, MultiAccess, is using.
Secret	Alpha-numeric	The secret is used by the Radius Server to encrypt and by the Radius Client to unencrypt user passwords during exchanges of Radius authentication packets. The client secret has to be identical to the one used by the Radius server. MultiAccess implements MD5 encryption.

Chapter 5 – Troubleshooting

What if I can't see the web page for my MultiAccess?

REMEDY: Is the PWR LED on the MultiAccess unit blinking? If not, then the unit is either malfunctioning or not turned on. If the PWR LED is flashing as a heart beat, then verify that the Admin PC is actually on the same subnet as the MultiAccess and that it can be "pinged."

Launch a Command Prompt.

(In WinNT, go to Start | Programs | Command Prompt.
In WinXP, go to Start | All Programs | Accessories | Command Prompt.
In Win2000, go to Start | Programs | Accessories | Command Prompt.)

Type **iPConfig** to verify that the Admin PC's IP address is in the same network as the MultiAccess's IP address.

Then type **ping 192.168.2.1** and press **Return**.

If the MultiAccess unit does reply to the ping and you are still unable to view the MultiAccess web page, then call Multi-Tech Tech Support for more assistance (1-800-972-2439).

What if I don't get an email when I set the mail server address?

This pertains to the procedure "Setting Up the Mail Server."

The email may have failed due to one of three causes:

(A) the name server is irresolvable,

(B) the mail server cannot be contacted; or

© the client PC running the mail software cannot connect to the mail server.

CAUSE A: During transmission, the name server's address could not be resolved (that is, the MultiAccess unit could not contact your name server).

RESPONSE A: Contact the MultiAccess unit using telnet and try to ping the name server.
telnet 192.168.x.x
user: admin
password: admin
ping 192.168.y.y (where this is the address of the name server)
If the name server ping fails, you must determine why it failed.
The name server may not be contact-able because it is on a different subnet. The name server ping could also fail because the default gateway has been set incorrectly.
If the name server ping succeeds, then try to ping the mail server using its domain name.
ping mail.ourcompany.com
If pinging the mail server by its domain name fails, then try pinging it by using its IP address (if this can be determined). If you succeed in pinging the mail server by its IP address but yet it cannot be pinged via its domain name, then the name server is not functioning correctly.
If the mail server can be pinged neither by its domain name nor by its IP address, then consider item B below.

CAUSE B: The mail server is not running or cannot be contacted from the MultiAccess unit.

RESPONSE B: Verify that the mail server is running by sending an email to yourself using your email software.

If you cannot send an email to yourself using your email software, then the mail server is not running and you should find out why.

If you can send an email to yourself using the email software, then there is a problem between your mail server and the MultiAccess unit. Call Multi-Tech Tech Support (1-800-972-2439).

CAUSE C: The client PC running the mail software cannot connect to the mail server.

RESPONSE C: If you, as a client, cannot send yourself an email, then contact your administrator; there may be a problem with your mail server.

If the Radius server shows the auth request was rejected?

CAUSE: The shared secret is wrong (case sensitive), the user is giving the wrong password, or the user doesn't have appropriate rights.

If the Radius server doesn't see the auth request?

CAUSE: The MultiAccess was not added to the clients file within the Radius server,

the Radius client is not set to the same set of UDP ports as the Radius server,

the Radius client is pointing to the wrong Radius server/IP address, or

there is a network problem blocking or dropping the request, Radius Protocol uses UDP to communicate.

RESPONSE: When the auth request is not seen by the Radius server, eventually the Radius client will report a "Radius Timeout" error, no response from the Radius server, and disconnect the user.

The MultiAccess can not tell which application, on the workstation, is opening the TCP port/socket.

Redirectors, telnet clients, and proprietary programs all appear the same to the MultiAccess because they all need to use/follow TCP/IP to get to the modem in the MultiAccess.

RESPONSE: Telnet to the modem in the MultiAccess and issue at commands, try to dial out. If it works, then the redirector is configured wrong, or the user application is configured wrong.

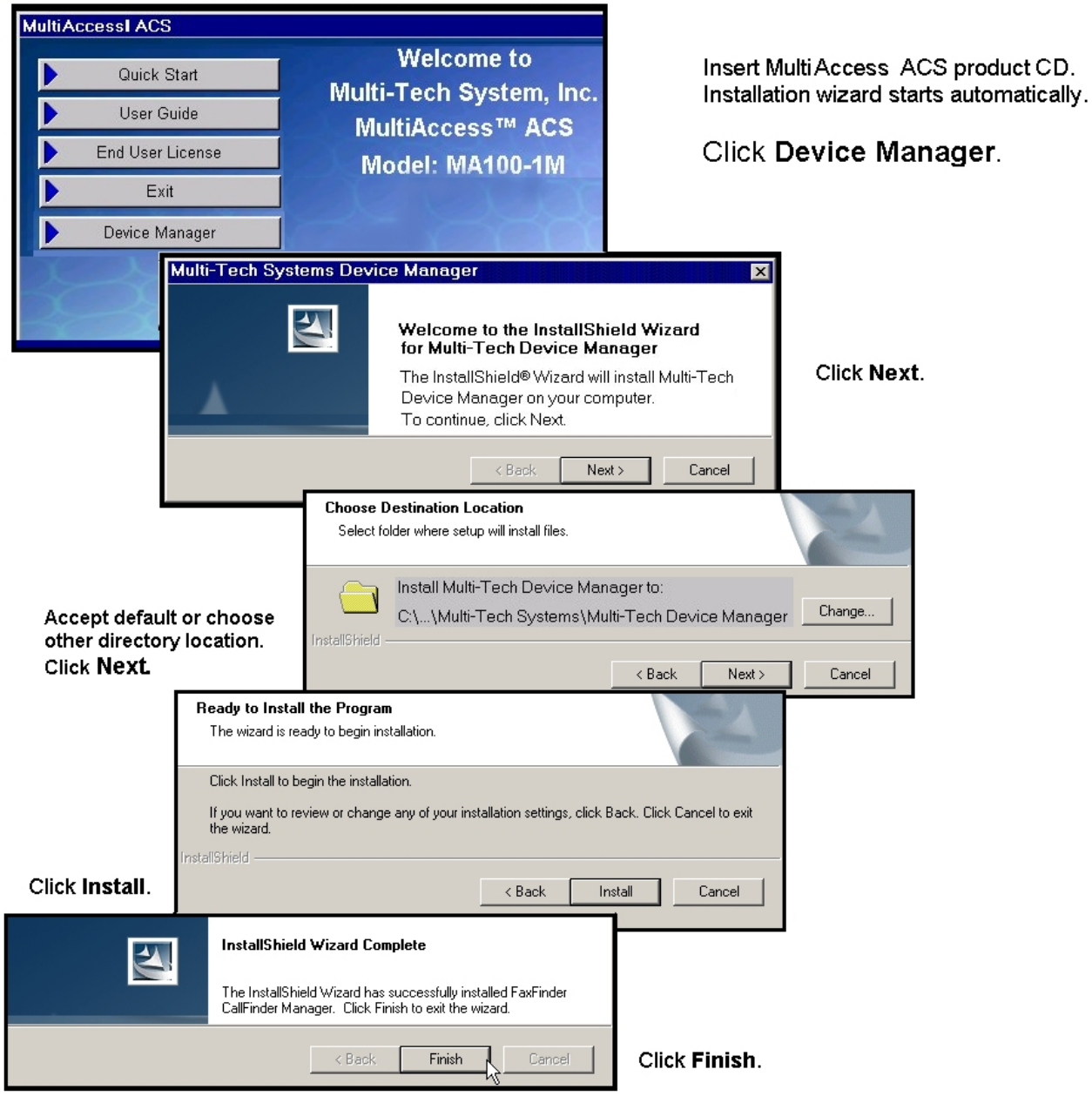
When the MultiAccess is configured for Modem Sharing with Radius Authentication, the user rights defined in the Radius server are not set correctly.

CAUSE: The Service Type Attribute in the Radius server configuration is not set to "Outbound".

Appendix A – Device Manager Utility

The Device Manger utility is used to synchronize phonebooks/local user data bases, backup and restore a configuration, and update firmware in a MultiAccess ACS unit and its accompanying POTS modem. The Device Manager utility can manage multiple MultiAccess ACS units on the same network and on other networks as long as the manager has access to that network.

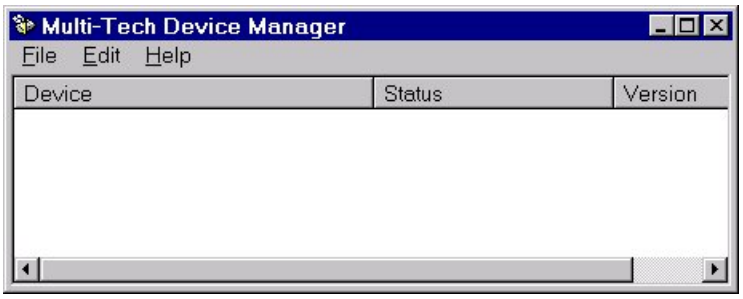
The process of installing the Device Manager utility is explained in the illustration below.


MultiAccessI ACS
Quick Start
User Guide
End User License
Exit
Device Manager
Welcome to
Multi-Tech System, Inc.
MultiAccess™ ACS
Model: MA100-1M
Insert MultiAccess ACS product CD.
Installation wizard starts automatically.
Click Device Manager.
Multi-Tech Systems Device Manager
Welcome to the InstallShield Wizard for Multi-Tech Device Manager
The InstallShield® Wizard will install Multi-Tech Device Manager on your computer. To continue, click Next.
< Back
Next >
Cancel
Click Next.
Choose Destination Location
Select folder where setup will install files.
Install Multi-Tech Device Manager to:
C:\...\Multi-Tech Systems\Multi-Tech Device Manager
Change...
InstallShield
< Back
Next >
Cancel
Accept default or choose other directory location. Click Next.
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel
Click Install.
InstallShield Wizard Complete
The InstallShield Wizard has successfully installed FaxFinder CallFinder Manager. Click Finish to exit the wizard.
< Back
Finish
Cancel
Click Finish.

Adding a Device to the Manager

In order for the Device Manager to recognize a MultiAccess ACS unit, the MA100-1M must be added to the manager. The Device Manager can manage multiple MA100-1M as long as the Device Manager has access to that network.

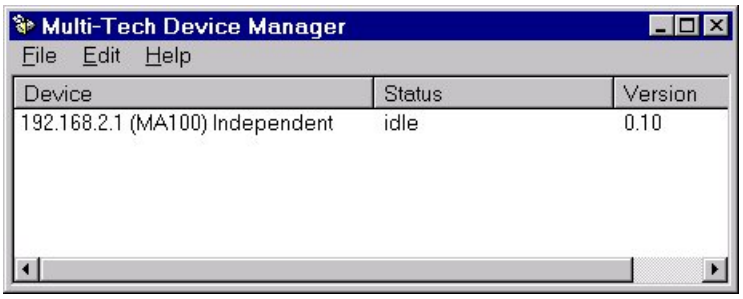
1. To launch the Device Manager program from the Windows desktop, go to **Start** | **Programs** | **Multi-Tech Device Manager** I **Multi-Tech Device Manager**. The Device Manager main screen will appear.



2. To add a MultiAccess ACS to the Manager, click **Edit** menu and select **Add Device**. When the **Add Device Address** screen appears, click on the **Select Server** down arrow and select **MultiAccess ACS**.

Add Device Address
Select Server
MultiAccess ACS
Server Behind Firewall
Enter Address
This can either be an IP Address (eg. 192.168.2.1) or a domain name that is assigned to the fax server (eg. Multi-Tech Device Manager1.multitech.prv)
Username:
Password:
This is the user ID/password combination assigned to you by your administrator to allow you to send faxes using this fax server.
OK
Cancel

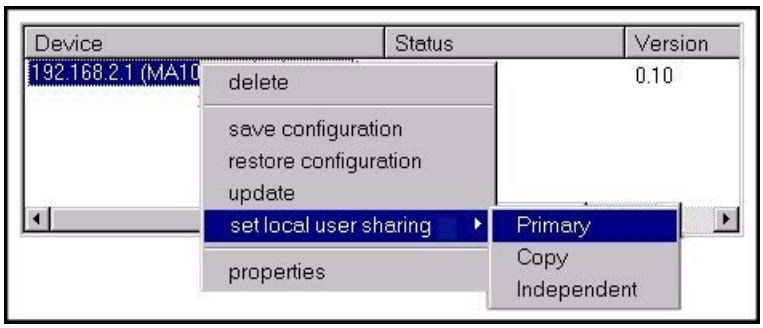
3. In the **Enter Address** window, enter the IP address for the unit you are adding.
4. In the **Username** and **Password** windows, enter the administrator's username and password for the unit you are adding.
5. Click **OK** when you are finished.
6. The Device Manager screen appears with the added Device.



Set Local User Sharing

Local user sharing must be set up per unit before local user data bases can be synchronized. When MultiAccess ACS local users are synchronized, all data bases contain the same user crentials except for the administrator accounts. One MultiAccess ACS unit (the **Primary** unit) holds the master list that is transmitted (using the **Synchronize Phonebooks/Local Users** command) to other MultiAccess ACS units on the network (**Copy** units). MultiAccess ACS units can operate on the same network, but have independent local user data bases, in which case they are designated **Independent**.

Designating one MultiAccess ACS as the master local user data base. In the main **Device Manager** screen, right-click on the unit to be designated as master, scroll to **set local user sharing**, and select **Primary**.



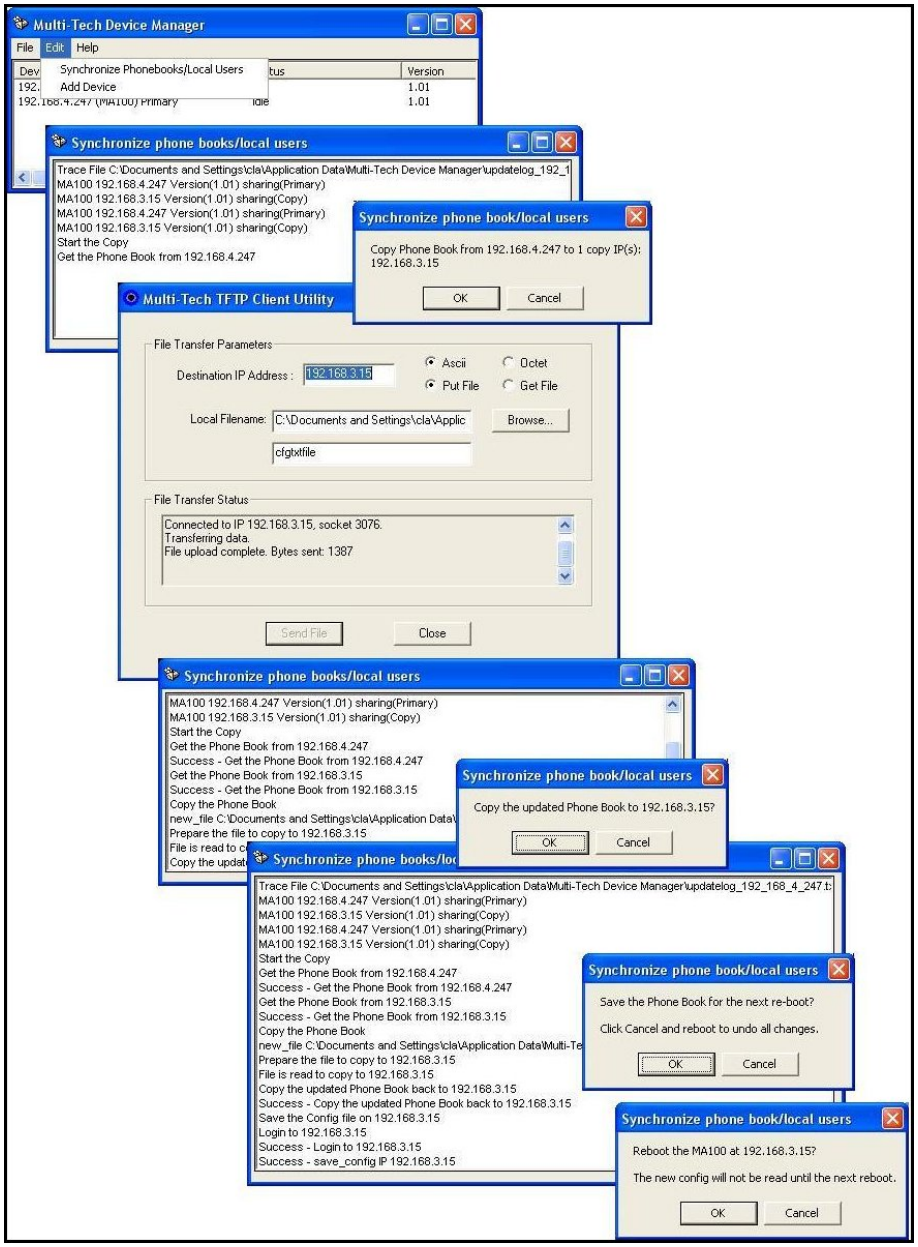
*Designating all other MultiAccess ACS units participating in local user sharing as **Copy** units*. In the main **Device Manager** screen, right-click on each unit to share the master local user data base, and select **Copy**.

Designating a MultiAccess ACS as independent. In the main **Device Manager** screen, right-click on the unit to be designated as master, scroll to **set local user sharing**, and select **Independent**.

Synchronize Phonebooks/Local Users

When MultiAccess ACS Local Users data bases are synchronized, all non-administrative listings match. One MultiAccess ACS unit (primary unit) holds the master data base that is transmitted to other remote units on the network (copy units). MultiAccess ACS units can operate on the network, but have independent Local Users, in which case they are designated as Independent. Independent units are ignored during synchronization.

1. *Invoking synchronization*. Click on the **Edit** menu and select **Synchronize Phonebooks/local users**.
2. The **Synchronize Phone Books** screen will appear along with a series of transient screens (denoting tftp data transfers) and confirmation screens.



3. After the master local users data is transferred to the first **Copy** MultiAccess ACS unit and that unit has been rebooted, the **Device Manager** will automatically begin synchronizing the additional **Copy** MultiAccess ACS unit on the network (if any) until all have been synchronized.

Updating Firmware

Over time, new versions of MultiAccess ACS firmware will be issued. When these newer versions become available, you will want to secure the firmware files (typically by downloading them from the MultiTech web site) and install them on the MultiAccess ACS.

There are two parts to a full firmware update:

(a) Updating POTS Modem 1 firmware (with file name of the form **dwqg<*x*><*y*>.hex;** where ***x*** is a number and ***y*** is a letter),

(b) Updating MultiAccess ACS firmware (with file name of the form **MA100-<*x*>-<*yz*>.bin**).

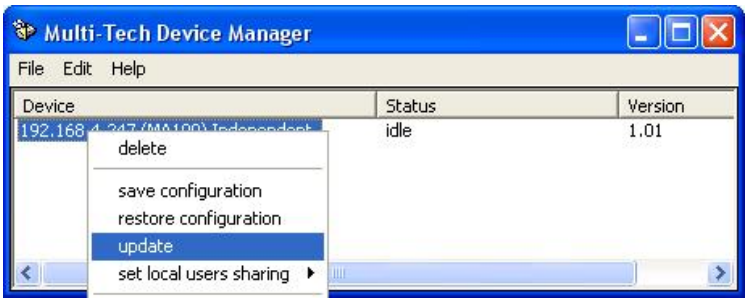
NOTE: *You must have the update files on your computer **before** beginning this procedure.* The latest version of these files will be available on the MultiTech web site. Put them in a directory on a computer connected to the network on which the MultiAccess ACS unit is running.

NOTE: Updating the MultiAccess ACS unit will take it out of operation for a few minutes (allow 10 minutes for each update if you already have the new firmware in a directory on the host computer). Do the update at a time that is not critical to your organization's usage of the MultiAccess ACS service.

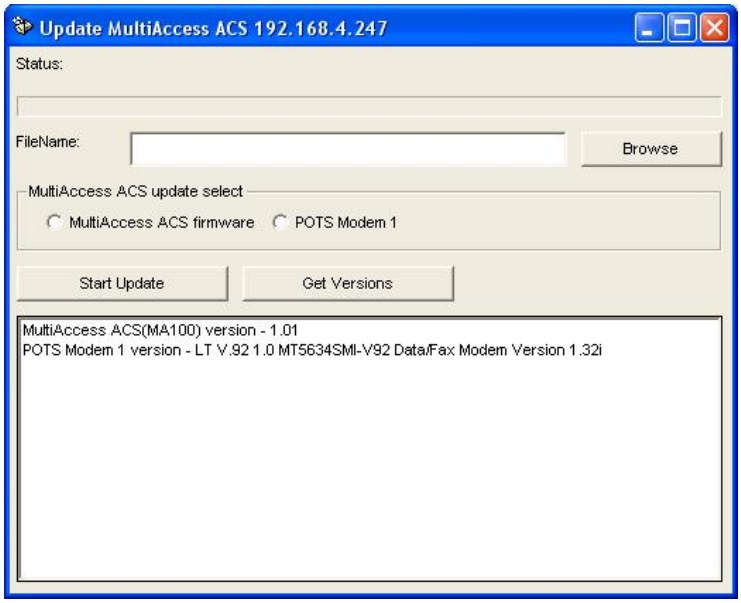
To update firmware, follow the steps shown below.

MultiAccess ACS Modem Firmware Update

1. Bring up the **Device Manager** Software main screen. In the **Device** column, identify the MultiAccess ACS unit on which the update is to be done. Be sure that the Status of that MultiAccess ACS unit is **idle** before continuning. (You cannot update the MultiAccess ACS while it is handling a call). Select that MultiAccess ACS unit and right-click on it. In the menu that appears, select **Update**.

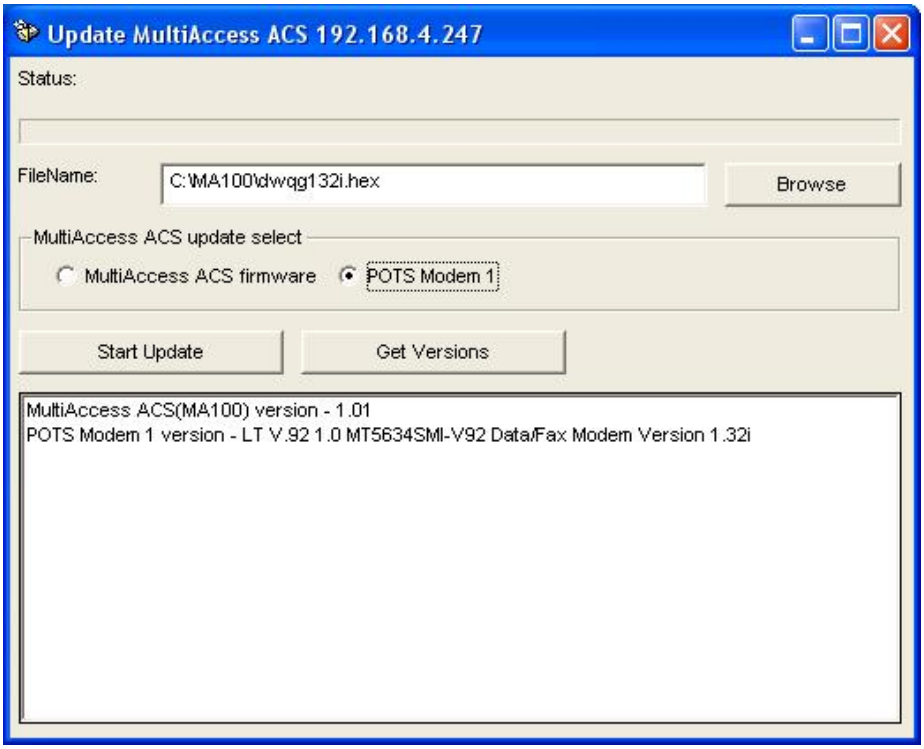


2. The **Update MultiAccess ACS N.N.N.N** screen will appear. The current firmware versions for the MultiAccess ACS's POTS Modem 1 will be listed in the main window.

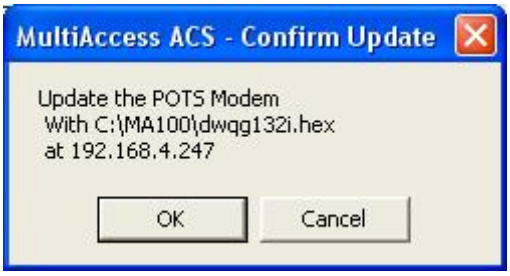


In the bottom (and largest) pane of the **Update MultiAccess ACS n.n.n.n** window, read the list and write down the version of firmware currently in use for the POTS modem. Compare the version with the update file that you plan to use. *Make sure that the file to be installed really does supersede the one currently installed.*

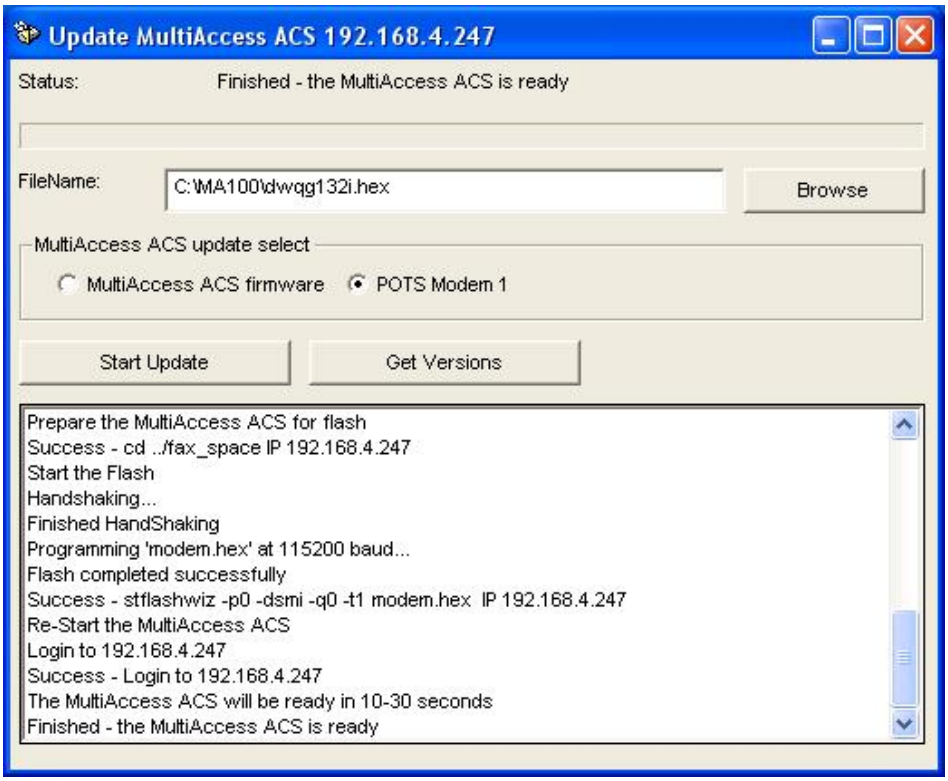
3. In the **MultiAccess ACS Update Select** field, select the POTS Modem 1 to update.
4. Browse to the location of the most recent firmware file.



5. Click Start Update.
6. The **MultiAccess ACS – Confirm Update** screen will appear. Click **OK**.



7. The updating process will take as long as a minute. During this time, several messages will appear in the **Update MultiAccess ACS N.N.N.N** window. A transient **TFTP** screen may appear briefly. If the updating process has been successful, the final message line will say "Finished – The MultiAccess ACS is ready."

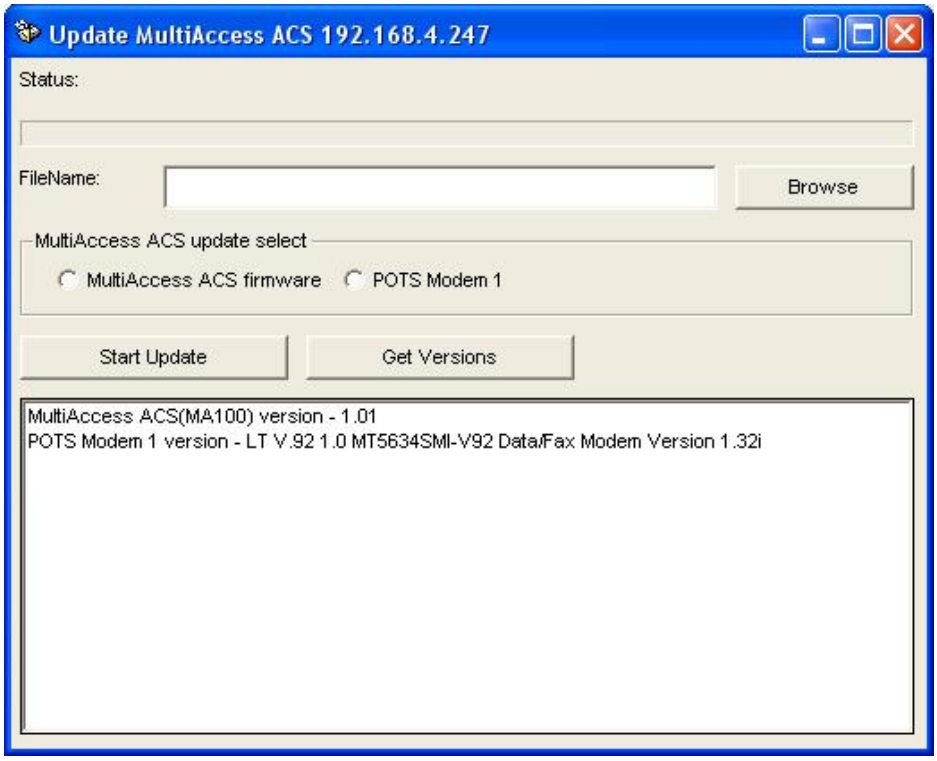


8. The updating process is now complete. Click the "X" in the upper-right corner to return to the main **Device Manager** screen.

MultiAccess ACS Firmware Update

1. In the **Device** column of the **Device Manager** screen, identify the MultiAccess ACS unit on which the update is to be done. Be sure that the Status of that MultiAccess ACS unit is **idle** before continuing. (You cannot update the MultiAccess ACS while it is handling a call.) Select that MultiAccess ACS unit and right-click on it. In the menu that appears, select **Update**.

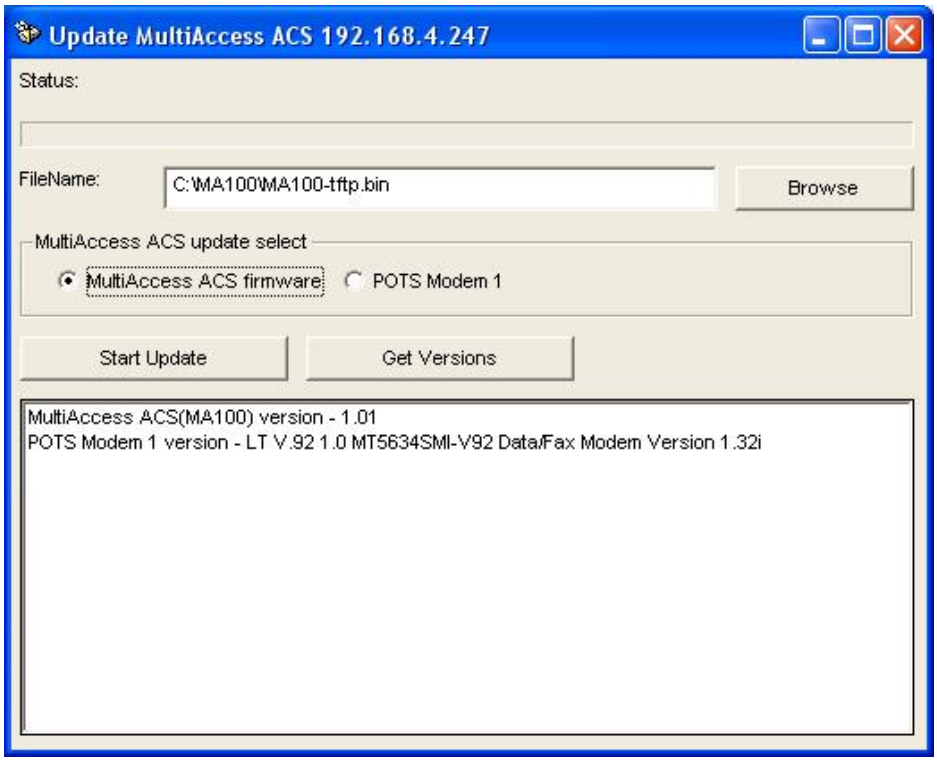
2. The **Update MultiAccess ACS N.N.N.N** screen will appear. The current firmware versions for the MultiAccess ACS firmware and for POTS Modem 1 will be listed in the main window.



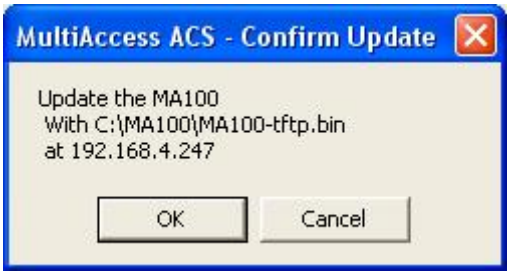
In the bottom (and largest) pane of the **Update MultiAccess ACS N.N.N.N** window, read the list and write down the version of firmware currently in use for the MultiAccess ACS. Compare the version with the update file that you plan to use. Make sure that the file to be installed really does supersede the one currently installed on the MultiAccess ACS.

3. In the **MultiAccess ACS Update Select** field, select "MultiAccess ACS firmware."

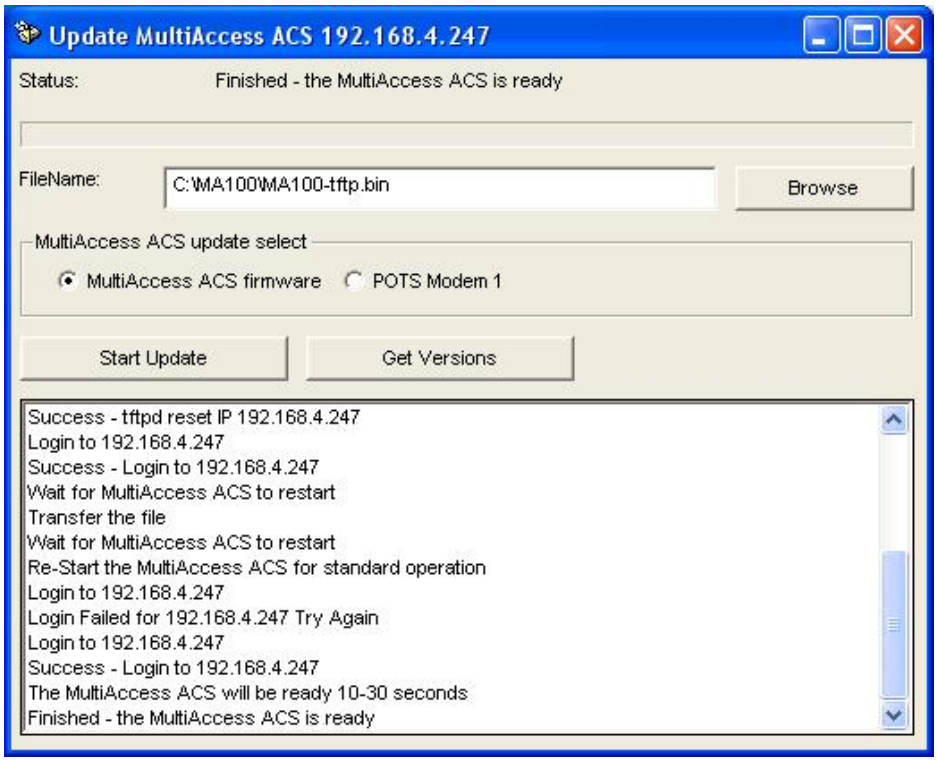
4. Browse to the location of the most recent firmware file.



5. Click Start Update.
6. The **MultiAccess ACS – Confirm Update** screen will appear. Click **OK**.



7. The updating process will take as long as a minute. During this time, several messages will appear in the **Update MultiAccess ACS N.N.N.N** window. A transient **TFTP** screen may appear briefly. If the updating process has been successful, the final message line will say "Finished – The MultiAccess ACS is ready."


Update MultiAccess ACS 192.168.4.247
Status:
Finished - the MultiAccess ACS is ready
FileName:
C:\MA100\MA100-tftp.bin
Browse
MultiAccess ACS update select
MultiAccess ACS firmware
POTS Modem 1
Start Update
Get Versions
Success - tftpd reset IP 192.168.4.247
Login to 192.168.4.247
Success - Login to 192.168.4.247
Wait for MultiAccess ACS to restart
Transfer the file
Wait for MultiAccess ACS to restart
Re-Start the MultiAccess ACS for standard operation
Login to 192.168.4.247
Login Failed for 192.168.4.247 Try Again
Login to 192.168.4.247
Success - Login to 192.168.4.247
The MultiAccess ACS will be ready 10-30 seconds
Finished - the MultiAccess ACS is ready

8. Close the **Update MultiAccess ACS N.N.N.N** window. In the main **Device Manager** window, the updated version will be listed.

9. Repeat steps 1-8 for each MultiAccess ACS unit in the system.

   NOTE: For proper operation of the MultiAccess ACS system, including the sharing of the Local Users data base data, the firmware version for all MultiAccess ACS units must be the same.

10. The updating process is now complete.

Appendix B – Regulatory Information

47 CFR Part 68 Telecom

1. This equipment complies with Part 68 of the 47 CFR rules and the requirements adopted by the ACTA. Located on this equipment is a label that contains, among other information, the registration number and ringer equivalence number (REN) for this equipment or a product identifier in the format:

   For current products is ***US:AAAEQ##Txxxx***.

   For legacy products is ***AU7USA-xxxxx-xx-x***.

   If requested, this number must be provided to the telephone company.
2. A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable 47 CFR Part 68 rules and requirements adopted by the ACTA. It's designed to be connected to a compatible modular jack that is also compliant.
3. The ringer equivalence number (REN) is used to determine the number of Devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the Devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of Devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. For products approved after July 23, 2001, the REN for this product is part of the product identifier that has the format US:AAAEQ##Txxxx. The digits represented by ## are the REN without a decimal point (*e.g.*, 03 is a REN of 0.3). For earlier products, the REN is separately shown on the label.
4. If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.
5. The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.
6. If trouble is experienced with this equipment, please contact Multi-Tech Systems, Inc. at the address shown below for details of how to have the repairs made. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.
7. Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.
8. No repairs are to be made by you. Repairs are to be made only by Multi-Tech Systems or its licensees. Unauthorized repairs void registration and warranty.
9. If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of this equipment does not disable your alarm equipment.

   If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.
10. Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.
11. This equipment is hearing aid compatible.

12. Manufacturing Information:

Manufacturer:	Multi-Tech Systems, Inc.
Trade Name:	MultiAccess ACS
Model Number:	MA100-1M
Registration No:	AU7USA-25814-M5-E
Ringer Equivalence:	0.3B
Modular Jack (USOC):	RJ11C or RJ11W (single line)
Service Center in USA:	Multi-Tech Systems, Inc. 2205 Woodale Drive Mounds View, MN 55112 U.S.A. (763) 785-3500 (763) 785-9874 Fax

47 CFR Part 15 Regulation

This equipment has been tested and found to comply with the limits for a **Class B** digital Device, pursuant to 47 CFR Part 15 regulations. The stated limits in this regulation are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Plug the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

This Device complies with Part 15 of the CFR 47 rules. Operation of this Device is subject to the following conditions:

(1) This Device may not cause harmful interference, and (2) this Device must accept any interference that may cause undesired operation.

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Fax Branding Statement

The Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic Device, including fax machines, to send any message unless such message clearly contains the following information:

- Date and time the message is sent
- Identification of the business or other entity, or other individual sending the message
- Telephone number of the sending machine or such business, other entity, or individual

This information is to appear in a margin at the top or bottom of each transmitted page or on the first page of the transmission. (Adding this information in the margin is referred to as *fax branding*).

Any number of fax software packages can be used with this product. Refer to the fax software manual for setup details. Typically, the fax branding information must be entered via the configuration menu of the software.

Canadian Limitations Notice

Notice: The ringer equivalence number (REN) assigned to each terminal Device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of Devices subject only to the requirement that the sum of the ringer equivalence numbers of all the Devices does not exceed 5.

Notice: The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The Industry Canada label does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations. Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment or equipment malfunctions may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Industry Canada

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Reglement Canadien sur le matériel brouilleur.

Safety and EMC Product Approvals

Safety
EN60950
UL60950
cUL

EMC Product Approvals
EN 55022
FCC Part 15 Class A
EN 55024

CE

EMC, Safety, and Directive Compliance

The CE mark is affixed to this product to confirm compliance with the following European Community Directives:

Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of Member States relating to electromagnetic compatibility;

and

Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limit;

And

Council Directive 1999/5/EC of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.

Appendix C – Waste Electrical and Electronic Equipment (WEEE) Statement

July, 2005

The WEEE directive places an obligation on EU-based manufacturers, distributors, retailers and importers to take-back electronics products at the end of their useful life. A sister Directive, ROHS (Restriction of Hazardous Substances) complements the WEEE Directive by banning the presence of specific hazardous substances in the products at the design phase. The WEEE Directive covers all Multi-Tech products imported into the EU as of August 13, 2005. EU-based manufacturers, distributors, retailers and importers are obliged to finance the costs of recovery from municipal collection points, reuse, and recycling of specified percentages per the WEEE requirements.

Instructions for Disposal of WEEE by Users in the European Union

The symbol shown below is on the product or on its packaging, which indicates that this product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.

Appendix D – C-ROHS HT/TS Substance Concentration

依照中国标准的有毒有害物质信息

根据中华人民共和国信息产业部 (MII) 制定的电子信息产品 (EIP)
标准－中华人民共和国《电子信息产品污染控制管理办法》（第 39 号），也称作中国 RoHS，下表列出了
Multi-Tech Systems Inc. 产品中可能含有的有毒物质 (TS) 或有害物质 (HS)
的名称及含量水平方面的信息。

成分名称	有害/有毒物▪/元素					
	铅 (PB)	汞 (Hg)	▪ (CD)	六价▪ (CR6+)	多▪▪苯 (PBB)	多▪二苯▪ (PBDE)
印刷▪路板	O	O	O	O	O	O
▪阻器	X	O	O	O	O	O
电容器	X	O	O	O	O	O
▪氧体磁▪	O	O	O	O	O	O
▪▪器/光学部件	O	O	O	O	O	O
IC	O	O	O	O	O	O
二极管/晶体管	O	O	O	O	O	O
振▪器和晶振	X	O	O	O	O	O
▪▪器	O	O	O	O	O	O
▪▪▪感器	O	O	O	O	O	O
▪▪器	O	O	O	O	O	O
▪声器	O	O	O	O	O	O
▪接器	O	O	O	O	O	O
LED	O	O	O	O	O	O
螺▪、螺母以及其它五金件	X	O	O	O	O	O
交流-直流▪源	O	O	O	O	O	O
▪件/文档 CD	O	O	O	O	O	O
手册和纸页	O	O	O	O	O	O
底▪	O	O	O	O	O	O

X 表示所有使用类似材料的设备中有害/有毒物质的含量水平高于 SJ/Txxx-2006 限量要求。

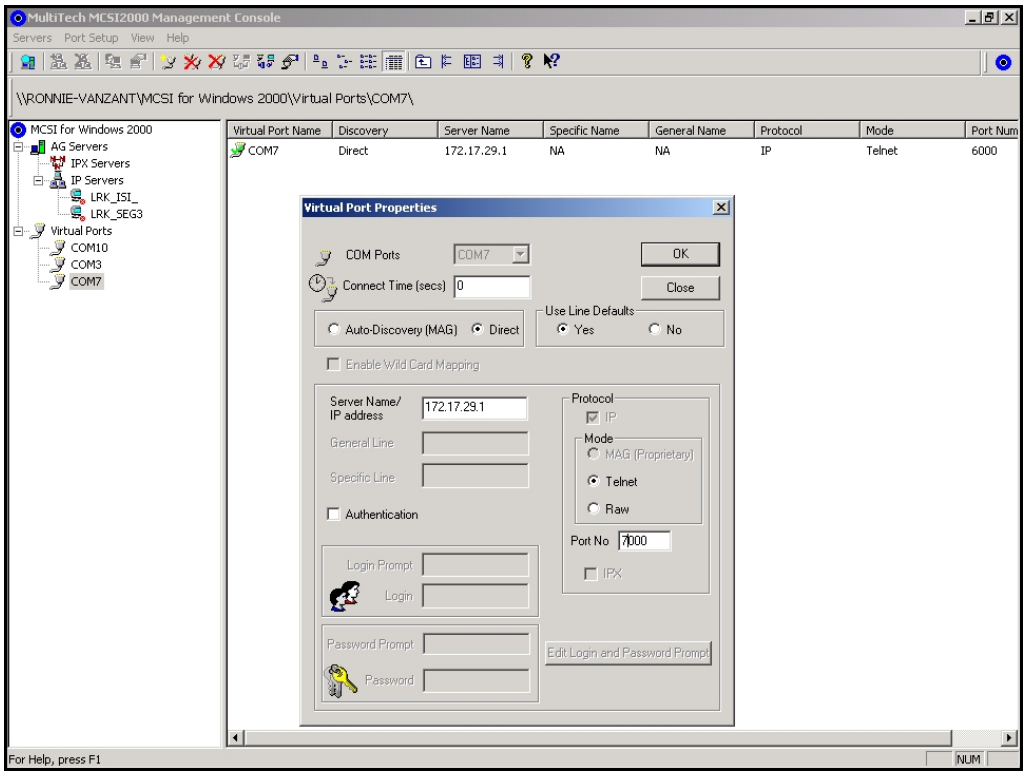
O 表示不含该物质或者该物质的含量水平在上述限量要求之内。

Appendix E – MCSI2000 Parameters

Setting Up MCSI2000 Com Port Redirector

Add one MCSI2000 com port to your workstation. Reboot the workstation. The properties of the MCSI2000 com port should be:

- Connect Time = 0
- Direct (Not MAG)
- Use Line Defaults Yes
- Server IP address is that of the MultiAccess
- Protocol Telnet
- Port Number 7000
- Authentication No.



For further details on how install and operate MCSI200, refer to the MCSI For Windows 2000 and XP Software Installation Guide on your product CD.

Appendix F – Modem AT Commands

AT Commands

Command: **AT** **Attention Code**
Values: N/A
Description: The attention code precedes all command lines except **A/**, **A:** and escape sequences.

Command: **ENTER Key**
Values: N/A
Description: Press the ENTER (RETURN) key to execute most commands.

Command: **A** **Answer**
Values: N/A
Description: Answer call before final ring.

Command: **A/** **Repeat Last Command**
Values: N/A
Description: Repeat the last command string. Do not precede this command with AT. Do not press ENTER to execute.

Command: **B*n*** **Communication Standard Setting**
Values: *n* = 0–3, 15, 16
Default: 0 and 15
Description:
B0 Select ITU-T V.22 mode when modem is at 1200 bps.
B1 Select Bell 212A when modem is at 1200 bps.
B2 Deselect V.23 reverse channel (same as **B3**).
B3 Deselect V.23 reverse channel (same as **B2**).
B15 Select V.21 when the modem is at 300 bps.
B16 Select Bell 103J when the modem is at 300 bps.

Command: **D*s*** **Dial**
Values: *s* = dial string (phone number and dial modifiers)
Default: none
Description: Dial telephone number *s*, where *s* may up to 40 characters long and include the 0–9, *, #, , B, C, and D characters, and the L, P, T, V, W, S, comma (,), semicolon (;), !, @, ^ and $ dial string modifiers.

Dial string modifiers:

L Redial last number. (Must be placed immediately after **ATD**.)
P Pulse-dial following numbers in command.
T Tone-dial following numbers in command (default).
V Switch to speakerphone mode and dial the following number. Use **ATH** command to hang up.
W Wait for a new dial tone before continuing to dial. (**X2**, **X4**, **X5**, **X6**, or **X7** must be selected.)
, Pause during dialing for time set in register S8.
; Return to command mode after dialing. (Place at end of dial string.)
! Hook flash. Causes the modem to go on-hook for one-half second, then off-hook again.
@ Wait for quiet answer. Causes modem to wait for a ringback, then 5 seconds of silence, before processing next part of command. If silence is not detected, the modem returns a NO ANSWER code.
^ Disable data calling tone transmission.
$ Detect AT&T call card "bong" tone. The character should follow the phone number and precede the user's call card number: **ATDT10288061278535000$123456789**

Command: **DS=*y*** **Dial Stored Telephone Number**
Values: *n* = 0–2 (0–1 for SMI-Parallel {internal})
Default: none
Description: Dial a number previously stored in directory number *y* by the **&Zy=x** command. Example: **ATDS=2**

Command: **E*n*** **Echo Command Mode Characters**
Values: *n* = 0 or 1
Default: 1
Description:
E0 Do not echo keyboard input to the terminal.
E1 Do echo keyboard input to the terminal.

Command: **F*n*** **Echo Online Data Characters**
Values: *n* = 1
Default: 1
F0 Enable online data character echo. (Not supported.)
F1 Disable online data character echo (included for backward compatibility with some software).

Command: **H*n*** **Hook Control**
Values: *n* = 0 or 1
Default: 0
Description:
H0 Go on-hook (hang up).
H1 Go off-hook (make the phone line busy).

Command: I*n* **Information Request**
Values: *n* = 0–5, 9, 11
Default: None
Description:
I0 Display default speed and controller firmware version.
I1 Calculate and display ROM checksum (e.g., *12AB*).
I2 Check ROM and verify the checksum, displaying *OK* or *ERROR*.
I3 Display default speed and controller firmware version.
I4 Display firmware version for data pump (e.g., 94).
I5 Display the board ID: software version, hardware version, and country/region ID
I9 Display the country/regional code (e.g., *NA Ver. 1*).
I11 Display diagnostic information for the last modem connection, such as DSP and firmware version, link type, line speed, serial speed, type of error correction/data compression, number of past retrains, etc.

Command: M*n* **Monitor Speaker Mode**
Values: *n* = 0, 1, 2, or 3
Default: 1
Description:
M0 Speaker always off.
M1 Speaker on until carrier signal detected.
M2 Speaker always on when modem is off-hook.
M3 Speaker on until carrier is detected, except while dialing.

Command: N*n* **Modulation Handshake**
Values: *n* = 0 or 1
Default: 1
Description:
N0 Modem performs handshake only at communication standard specified by S37 and the B command.
N1 Modem begins handshake at communication standard specified by S37 and the B command. During handshake, fallback to a lower speed can occur.

Command: O*n* **Return Online to Data Mode**
Values: 0, 1, 3
Default: None
Description:
O0 Exit online command mode and return to data mode (see *+++AT<CR>* escape sequence).
O1 Issue a retrain and return to online data mode.
O3 Issue a rate renegotiations and return to data mode.

Command: P **Pulse Dialing**
Values: P, T
Default: T
Description: Configures the modem for pulse (non-touch-tone) dialing. Dialed digits are pulsed until a **T** command or dial modifier is received.

Command: Q*n* **Result Codes Enable/Disable**
Values: *n* = 0 or 1
Default: 0
Description:
Q0 Enable result codes.
Q1 Disable result codes.
Q2 Returns an *OK* for backward compatibility with some software.

Command: **Sr=*n*** **Set Register Value**
Values: *r* = S-register number; *n* varies
Default: None
Description: Set value of register S*r* to value of *n*, where *n* is entered in decimal format (e.g., S0=1).

Command: **Sr?** **Read Register Value**
Values: *r* = S-register number
Default: None
Description: Read value of register **S*r*** and display it in 3-digit decimal form (e.g., **S2?** gives the response *043)*.

Command: **T** **Tone Dialing**
Values: P, T
Default: T
Description: Configures the modem for DTMF (touch-tone) dialing. Dialed digits are tone dialed until a **P** command or dial modifier is received.

Command: **V*n*** **Result Code Format**
Values: *n* = 0 or 1
Default: 1
Description:
V0 Displays result codes as digits (terse response).
V1 Displays result codes as words (verbose response).

Command: **W*n*** **Result Code Options**
Values: *n* = 0, 1, or 2
Default: 2
Description:
W0 CONNECT result code reports serial port speed, disables protocol result codes.
W1 CONNECT result code reports serial port speed, enables protocol result codes.
W2 CONNECT result code reports line speed, enables protocol result codes.

Command: **X*n*** **Result Code Selection**
Values: *n* = 0–7
Default: 4
Description:
X0 Basic result codes (*CONNECT*); does not look for dial tone or busy signal.
X1 Extended result codes (*CONNECT 46000 V42bis*); does not look for dial tone or busy signal.
X2 Extended result codes with *NO DIALTONE*; does not look for busy signal.
X3 Extended result codes with *BUSY*; does not look for dial tone.
X4 Extended result codes with *NO DIALTONE* and *BUSY*.
X5 Extended result codes with *NO DIALTONE* and *BUSY*.
X6 Extended result codes with *NO DIALTONE* and *BUSY*.
X7 Basic result codes with *NO DIALTONE* and *BUSY*.

Command: **Z*n*** **Modem Reset**
Values: *n* = 0 or 1
Default: None
Description:
Z0 Reset modem to profile saved by the last **&W** command.
Z1 Same as **Z0**.

Command: &C*n* **Data Carrier Detect (DCD) Control**
Values: *n* = 0, 1, 2
Default: 1
Description:
&C0 Forces the DCD circuit to be always ON.
&C1 DCD goes ON when the remote modem's carrier signal is detected, and goes OFF when the carrier signal is not detected.
&C2 DCD turns OFF upon disconnect for time set by S18. It then goes high again (for some PBX phone systems).

Command: &D*n* **Data Terminal Ready (DTR) Control**
Values: *n* = 0, 1, 2, or 3
Default: 2
Description:
&D0 Modem ignores true status of DTR signal and responds as if it is always on.
&D1 If DTR drops while in online data mode, the modem enters command mode, issues an *OK*, and remains connected.
&D2 If DTR drops while in online data mode, the modem hangs up. If the signal is not present, the modem will not answer or dial.
&D3 If DTR drops, modem hangs up and resets as if **ATZ** command were issued.

Command: &E*n* **XON/XOFF Pacing Control**
Values: *n* = 12 or 13
Default: 12
Description:
&E12 Disables XON/XOFF pacing.
&E13 Enables XON/XOFF pacing.

Command: &F*n* **Load Factory Settings**
Values: *n* = 0
Default: None
Description:
&F0 Load factory settings as active configuration.
Note: See also the **Z** command.

Command: &G*n* **V.22bis Guard Tone Control**
Values: *n* = 0, 1, or 2
Default: 0
Description:
&G0 Disable guard tone.
&G1 Set guard tone to 550 Hz.
&G2 Set guard tone to 1800 Hz.
Note: The **&G** command is not used in North America.

Command: &K*n* **Flow Control Selection**
Values: *n* = 0, 3, or 4
Defaults: 3
Description:
&K0 Disable flow control.
&K3 Enable CTS/RTS hardware flow control.
&K4 Enable XON/XOFF software flow control.

Command: &L*n* **Leased Line Operation**
Values: *n* = 0, 1, or 2
Defaults: 0
Description:
&L0 The modem is set for standard dial-up operation.
&L1 The modem is set for leased line operation in originate mode.
&L2 The modem is set for leased line operation in answer mode.

Note: For **&L1** and **&L2**, there is a 30-second window between power up and the starting of the leased line handshake. During this time, you can turn off the command, if desired.

Command: &P*n* **Pulse Dial Make-to-Break Ratio Selection**
Values: *n* = 0, 1, or 2
Default: 0
Description:
&P0 60/40 make-to-break ratio
&P1 67/33 make-to-break ratio
&P2 20 pulses per second

Note: The **&P2** command is available only if the country/regional code is set to Japan.

Command: &Q*n* **Asynchronous Communications Mode**
Values: *n* = 0, 5, 6, 8, or 9
Default: 5
Description:
&Q0 Asynchronous with data buffering. Same as **\N0**.
&Q5 Error control with data buffering. Same as **\N3**.
&Q6 Asynchronous with data buffering. Same as **\N0**.
&Q8 MNP error control mode. If MNP error control is not established, the modem falls back according to the setting in **S36**.
&Q9 V.42 or MNP error control mode. If neither error control is established, the modem falls back according to the setting in **S36**.

Command: &S*n* **Data Set Ready (DSR) Control**
Values: *n* = 0 or 1
Default: 0
Description:
&S0 DSR is always ON.
&S1 DSR goes ON only during a connection.

Command: &T*n* **Loopback Test (V.54 Test) Commands**
Values: *n* = 0, 1, 3, 6
Default: None

Description: The modem can perform selected test and diagnostic functions. A test can be run only when the modem is operating in non-error-correction mode (normal or direct mode). For tests 3 and 6, a connection between the two modems must be established. To terminate a test in progress, the escape sequence (**+++AT**) must be entered.
&T0 Stops any test in progress.
&T1 Starts a local analog loopback, V.54 Loop 3, test. If a connection exists when this command is issued, the modem hangs up. When the test starts, a *CONNECT* message is displayed.
&T3 Starts local digital loopback, V.54 Loop 2, test. If no connection exists, *ERROR* is returned.
&T6 Initiates a remote digital loopback, V.54 Loop 2, test without self-test. If no connection exists, *ERROR* is returned.

Command: &V **Display Current Settings**
Values: N/A
Description: Displays the active modem settings.

Command: &W*n* **Store Current Configuration**

Values: *n* = 0 or 1

Default: 1

Description:

&W0 Stores current modem settings in non-volatile memory and causes them to be loaded at power-on or following the **ATZ** command instead of the factory defaults. See **&F** command.

&W1 Clears user default settings from non-volatile memory and causes the factory defaults to be loaded at power-on or following the **ATZ** command.

Command: &Zy=*x* **Store Dialing Command**

Values: *y* = 0–2 (0–1SMI-Parallel {internal})
x = Dialing command

Default: None

Description: Stores dialing command *x* in memory location *y*. Dial the stored number using the command **ATDS=y**. See Also the #CBS command, a callback security command.

Command: \A*n* **Select Maximum MNP Block Size**

Values: *n* = 0, 1, 2, or 3

Default: 3

Description:

\A0 64-character maximum
\A1 128-character maximum
\A2 192-character maximum
\A3 256-character maximum

Command: \B*n* **Transmit Break**

Values: *n* = 0–9 in 100 ms units

Default: 3

Description: In non-error-correction mode only, sends a break signal of the specified length to a remote modem. Works in conjunction with the ***\K*** command.

Command: **\K*n*** **Break Control**
Values: *n* = 0–5
Default: 5
Description: Controls the modem's response to a break received from: computer, remote modem, or **\B** command. Response is different for each of three different states.

Data mode. Modem receives the break from the computer:
\K0 Enter online command mode, no break sent to the remote modem.
\K1 Clear data buffers and send break to the remote modem.
\K2 Same as **\K0**.
\K3 Send break immediately to the remote modem.
\K4 Same as **\K0**.
\K5 Send break to the remote modem in sequence with the transmitted data.

Data mode. Modem receives the break from the remote modem:
\K0 Clear data buffers and send break to the computer.
\K1 Same as **\K0**.
\K2 Send break immediately to the computer.
\K3 Same as **\K2**.
\K4 Send break to the computer in sequence with the received data.
\K5 Same as **\K4**.

Online command mode. Modem receives a \Bn command from the computer:
\K0 Clear data buffers and send break to the remote modem.
\K1 Same as **\K0**.
\K2 Send break immediately to the remote modem.
\K3 Same as **\K2**.
\K4 Send break to the remote modem in sequence with the transmitted data.
\K5 Same as **\K4**.

Command: **\N*n*** **Error Correction Mode Selection**
Values: *n* = 0–5, or 7
Default: 3
Description:
\N0 Non-error correction mode with data buffering (buffer mode; same as **&Q6**).
\N1 Same as **N0**.
\N2 MNP reliable mode. If the modem cannot make an MNP connection, it disconnects.
\N3 V.42/MNP auto-reliable mode. The modem attempts first to connect in V.42 error correction mode, then in MNP mode, and finally in non-error correction (buffer) mode with continued operation.
\N4 V.42 reliable mode. If the modem cannot make a V.42 connection, it disconnects.
\N5 V.42, MNP, or non-error correction (same as **\ N3**).
\N7 V.42, MNP, or non-error correction (same as **\ N3**).

Command: **\Q*n*** **Flow Control Selection**
Values: n = 0, 1, or 3
Default: 3
Description:
\Q0 Disable flow control (same as **&K0**).
\Q1 XON/XOFF software flow control (same as **&K4**).
\Q2 CTS-only flow control. Not supported.
\Q3 RTS/CTS hardware flow control (same as **&K3**).

Command: **\Tn** **Inactivity Timer**
Values: n = 0, 1–255
Default: 0
Description: Sets the time (in minutes) after the last character is sent or received that the modem waits before disconnecting. A value of zero disables the timer. Applies only in buffer mode.

Note: You can also set the inactivity timer by changing the value of **S30**.

Command: **\Vn** **Protocol Result Code**
Values: n = 0, 1, or 2
Default: 1
Description:
\V0 Disables the appending of the protocol result code to the DCE speed.
\V1 Enables the appending of the protocol result code to the DCE speed.
\V2 Same as **\V1**.

Command: **\X*n*** **XON/XOFF Pass-Through**
Values: *n* = 0 or 1
Default: 0
Description: \X0 Modem responds to and discards XON/XOFF characters.
\X1 Modem responds to and passes XON/XOFF characters.
Note: This is also controlled via **&E6** and **&E7**.

Command: **-C*n*** **Data Calling Tone**
Values: *n* = 0 or 1
Defaults: 1
Description: -C0 Disable V.25 data calling tone to deny remote data/fax/voice discrimination.
-C1 Enable V.25 data calling tone to allow remote data/fax/voice discrimination.

Command: **%A** **Adaptive Answer Result Code Enable**
Values: *n* = 0 or 1
Default: 0
Description: The %A command controls whether the DATA or FAX result codes will be sent by the modem. The modem must be in fax mode for this command to work. Also, the modem must be set to **+FAA=1**, which enables the modem to distinguish between a fax and a data call. When these commands are enabled, the modem sends DATA to the computer when it detects data tones and FAX when it detects fax tones. These strings are used by some servers to select the appropriate communication program.
%A0 Disables adaptive answer result codes.
%A1 Enables adaptive answer result codes.

Command: **%B** **View Numbers in Blacklist**
Values: N/A
Description: If blacklisting is in effect, **AT%B** displays the numbers for which the last call attempted in the previous two hours failed. In countries that do not require blacklisting, the *ERROR* result code appears.

Command: **%C*n*** **Data Compression Control**
Values: *n* = 0 or 1
Default: 1
Description: %C0 Disable V.42bis/MNP 5 data compression.
%C1 Enable V.42bis/MNP 5 data compression.

Command: **%DC*n*** **AT Command Control**
Values: *n* = 0 or 1
Default: 0
Description: %DC0 The modem responds to AT commands.
%DC1 The modem ignores AT commands.
Note: The modem will respond to **AT%DC** for 10 seconds after power-up.

Command: **%E*n*** **Fallback and Fall Forward Control**
Values: *n* = 0, 1, or 2
Default: 2
Description: %E0 Disable fallback and fall forward.
%E1 Enable fallback, disable fall forward.
%E2 Enable fallback and fall forward.

Command: **%H*n*** **Direct Connect Enable**
Values: *n* = 0, 1
Default: 0
Description: %H0 Sets callback security to normal operation.
%H1 All callback security calls will be direct connect regardless of whether the password or phone number has the **-** character.

Command: %R*n* **Cisco Configuration**
Values: *n* = 0, 1
Default: 0
Description:
%R0 Disables Cisco configuration.
%R1 Sets **E0**, **Q1**, **&D0**, **\N0**, **$SB9600**, and **%S1** for operation with a Cisco router.

Command: %S*n* **Command Speed Response**
Values: *n* = 0, 1
Default: 0
Description:
%S0 Sets modem to respond to AT commands at all normal speeds.
%S1 AT commands accepted at 115200 bps only. Commands at other speeds are ignored.

Command: $D*n* **DTR Dialing**
Values: *n* = 0 or 1
Default: 0
Description:
$D0 Disables DTR dialing.
$D1 Dials the number in memory location 0 when DTR goes high.

Command: $EB*n* **Asynchronous Word Length**
Values: *n* = 0 or 1
Default: 0
Description:
$EB0 Enables 10-bit mode.
$EB1 Enables 11-bit mode.

Command: $MB*n* **Online BPS Speed**
Values: *n* = speed in bits per second
Default: 28,800
Description:

$MB75	Selects CCITT V.23 mode
$MB300	Selects 300 bps on-line
$MB1200	Selects 1200 bps on-line
$MB2400	Selects 2400 bps on-line
$MB4800	Selects 4800 bps on-line
$MB9600	Selects 9600 bps on-line
$MB14400	Selects 14400 bps on-line
$MB19200	Selects 19200 bps on-line
$MB28800	Selects 28800 bps on-line
$MB33600	Selects 33600 bps on-line

Command: $RP*n* **Ring Priority vs. AT Command Priority**
Values: *n* = 0 or 1
Default: 1
Description:
$RP0 The AT command will have priority over the ring. S1 will be reset to 0 if an AT command is received. This command is storable to memory.
$RP1 The ring will have priority over the AT command. S1 will increment even if an AT command and ring are received together and the incoming call will be answered when S1 is equal to S0.
Note: SocketModems do not detect ring cadence of TelTone telephone line simulators as a valid ring.

Command: $SB*n* **Serial Port Baud Rate**
Values: *n*= speed in bits per second
Default: 57600
Description:

$SB300	Sets serial port to 300 bps
$SB1200	Sets serial port to 1200 bps
$SB2400	Sets serial port to 2400 bps
$SB4800	Sets serial port to 4800 bps
$SB9600	Sets serial port to 9600 bps
$SB19200	Sets serial port to 19200 bps
$SB38400	Sets serial port to 38400 bps
$SB57600	Sets serial port to 57600 bps
$SB115200	Sets serial port to 115200 bps
$SB230400	Sets serial port to 230400 bps

Command: **+VDR=x, y** **Distinctive Ring Report**

Values: x = 0, 1 Distinctive Ring report control. See description.
y = 0–255 Minimum ring interval in 100 ms units. See description.

Default: 0, 0

Description: Enables reporting of ring cadence information to the DTE and specifies the minimum ring cadence that will be reported.

The report format is one line per silence period and one line per ring period. The length of the silence period is in the form DROF=number in units of 100 ms<CR><LF>, and the length of the ring is in the form DRON=number in units of 100 ms<CR> <LF>. The modem may produce a Ring event code after the DRON message if enabled by the y parameter. The y parameter must be set to a value equal to or smaller than the expected ring cadence in order to pass the report to the DTE.

+VDR=0, N/A	Disables Distinctive Ring cadence reporting.
+VDR=1, 0	Enables Distinctive Ring cadence reporting. Other call progress result codes (including RING) are reported as normal.
+VDR=1, >0	Enables Distinctive Ring cadence reporting. The RING result code is reported after the falling edge of the ring pulse (i.e., after the DRON report).
+VDR=?	Displays the allowed values.
+VDR?	Displays the current value.

Command: **#CBAn** **Callback Attempts**
Values: n = 1–255
Default: 4
Description: Sets the number of callback attempts that are allowed after passwords have been exchanged between modems.

Command: **#CBDn** **Callback Delay**
Values: n = 0–255
Default: 15
Description: Sets the length of time (in seconds) that the modem waits before calling back the remote modem.

Command: **#CBF?** **Callback Failed Attempts Display**
Values: N/A
Default: N/A
Description: Requests the number of failed callback passwords since reset or power-up. This number can be stored to nonvolatile memory using the **&W** command.

Command: **#CBFR** **Callback Failed Attempts Reset**
Values: N/A
Default: N/A
Description: Resets the number of failed callback passwords to 0. This does not reset the number stored in nonvolatile memory.

Command: **#CBIn** **Local Callback Inactivity Timer**
Values: n = 1–255
Default: 20
Description: Sets the time (in minutes) that the modem waits for a command before forcing the user to enter the setup password again.

Command: **#CBNy=x** **Store Callback Password**
Values: y = 0–29
x = password
Defaults: None
Description: Sets the callback security password for the y memory location. The password must have 6 to 10 characters, and cannot include the + or - characters.

Command: **#CBPn** **Callback Parity**
Values: n = 0, 1, or 2
Default: 0
Description: Sets parity for the callback security messages.
#CBP0 No parity.
#CBP1 Odd parity.
#CBP2 Even parity.

Command: **#CBRy** **Callback Security Reset**
Values: y = 0–29
Default: None
Description: Clears the password and phone number in the **y** memory location.

Command: **#CBSn** **Callback Enable/Disable**
Values: n = 0, 1, 2, or 3
Default: 0
Description:
#CBS0 Disables callback security.
#CBS1 Enables local and remote callback security.
#CBS2 Enables remote callback security only.
#CBS3 Disables callback security until local hang-up or reset.

Command: **#Pn** **Set 11-bit Parity**
Values: n = 0 or 1
Default: 2
Description:
#P0 No parity.
#P1 Odd parity.
#P2 Even parity.

Command: **#S*x*** **Enter Setup Password**
Values: *x*= password (1–8 characters, case sensitive)
Default: MTSMODEM
Description: Enters the remote configuration setup password.

Command: **#S=*x*** **Store Setup Password**
Values: *x*= password (1–8 characters, case sensitive)
Default: MTSMODEM
Description: Stores a new remote configuration setup password.

Escape AT Commands

Command: **+++AT<CR>** **Escape Sequence**
Values: N/A
Description: Puts the modem in command mode (and optionally issues a command) while remaining online. Type **+++AT** and up to six optional command characters; then press ENTER. Used mostly to issue the hang-up command: **+++ATH<CR>**.

Command: **%%%ATMTSMODEM<CR>** **Remote Configuration Escape Sequence**
Values: N/A
Description: Initiates remote configuration mode while online with remote modem. The remote configuration escape character (%) is defined in register **S13**.

V.92 Commands

Command: +MS= Modulation Selection

Values: See description.

Defaults: See description.

Description: This extended-format command selects modulation, enables or disables automode, and specifies the highest downstream and upstream connection rates using one to four subparameters.

The command syntax is
+MS=[mod][,[automode][,[0][,[max_rate][,[0][,[max_rx_rate]]]]]]<CR>
Subparameters that are not entered retain their current value. Commas separate optional subparameters, and must be inserted to skip a subparameter. Example: +MS=,0<CR> disables automode and keeps all other settings at their current values.

+MS=? Reports supported options in the format (list of supported mod values),(list of supported automode values),(0),(list of supported max_rate values),(0),(list of supported max_rx_rate values). Example: +MS: (BELL103, V21, BELL212A, V22, V22B, V23C, V32, V32B, V34, V90, V92), (0, 1), (0), (0-33600), (0), (0-56000)

+MS? Reports current options in the format mod, automode, 0, max_rate, 0, max_rx_rate. Example: +MS: V92, 1, 0, 31200, 0, 56000.

Subparameters

mod Specifies the preferred modulation (automode enabled) or the modulation to use in originating or answering a connection (automode disabled). The default is V92.

mod	**Modulation**	**Possible rates (bps)[1]**
V92[2]	V92	56000, 54666, 53333, 52000, 50666, 49333, 48000, 46666, 45333, 44000, 42666, 41333. 40000, 38666, 37333, 36000, 34666, 33333, 32000, 30666, 29333, or 28000
V903	V.90	56000, 54666, 53333, 52000, 50666, 49333, 48000, 46666, 45333, 44000, 42666, 41333. 40000, 38666, 37333, 36000, 34666, 33333, 32000, 30666, 29333, or 28000
V34	V.34	33600, 31200, 28800, 26400, 24000, 21600,19200, 16800, 14400, 12000, 9600, 7200, 4800, or 2400
V32B	V.32bis	14400, 12000, 9600, 7200, or 4800
V32	V.32	9600 or 4800
V22B	V.22bis	2400 or 1200
V22	V.22	1200
V23C	V.23	1200
V21	V.21	300
Bell212A	Bell 212A	1200
Bell103	Bell 103	300

Notes:

1. See optional <*automode*>, <*max_rate*>, and <*max_RX_rate*> subparameters.
2. Selects V.92 modulation as first priority. If a V.92 connection cannot be established, the modem attempts V.90, V.34, V.32bis, etc.
3. Selects V.90 modulation as first priority. If a V.90 connection cannot be established, the modem attempts V.34, V.32bis, etc.

automode An optional numeric value that enables or disables automatic modulation negotiation using V.8 bis/V.8 or V.32 bis Annex A. Automode is disabled if values are specified for the max_rate and max_rx_rate parameters. The options are:

0 Disable automode
1 Enable automode (default)

max_rate An optional number that specifies the highest rate at which the modem may establish an upstream (transmit) connection. The value is decimal coded in units of bps, for example, 33600 specifies the highest rate to be 33600 bps.

0 Maximum rate determined by the modulation selected in mod (default).

300–33600 Maximum rate value limited by the modulation selected in mod. For valid max_rate values for each mod value, see the following table.

***mod* value**	**Valid *max_rate* values (bps)**
V92, V90, V34	31200, 28800, 26400, 24000, 21600,19200, 16800, 14400, 12000, 9600, 7200, 4800, 2400
V32B	19200, 16800, 14400, 12000, 9600, 7200, 4800
V32	14400, 12000, 9600, 7200, 4800
V22B	2400
V22, V23C, Bell212A	1200
V21, Bell103	300

max_rx_rate An optional number that specifies the highest rate at which the modem may establish a downstream (receive) connection. The value is decimal coded in units of bps, e.g., 28800 specifies the highest rate to be 28800 bps.

0 Maximum rate determined by the modulation selected in ***mod*** (default).

300–56000 Maximum rate value limited by the modulation selected in *mod*. See “Possible rates” in the *mod* table.

Command: +PCW=n **Call Waiting Enable**
Values: n = 0, 1, or 2
Default: 2
Description: Controls the action to be taken upon detection of a call waiting tone in V.92 mode. Values specified by this command are not modified when an **AT&F** command is issued.
+PCW=0 Toggles V.24 Circuit 125 and collects Caller ID if enabled by +VCID
+PCW=1 Hangs up
+PCW=2 Ignores V.92 call waiting
+PCW=? Displays the allowed values
+PCW? Displays the current value

Command: +PIG=n **PCM Upstream Ignore**
Values: n = 0 or 1
Default: 1
Description: Controls the use of PCM upstream during V.92 operation. PCM upstream allows faster upload speeds to a V.92 server.
+PIG=0 Disables PCM upstream
+PIG=1 Enables PCM upstream
+PIG=? Displays the allowed values
+PIG? Displays the current value

Command: +PMH=n **Modem on Hold Enable**
Values: n = 0 or 1
Default: 1
Description: Controls if modem on hold procedures are enabled during V.92 operation. Normally controlled by a modem on hold program. Values specified by this command are not modified when an **AT&F** command is issued.
+PMH=0 Enables V.92 modem on hold
+PMH=1 Disables V.92 modem on hold
+PMH=? Displays the allowed values
+PMH? Displays the current value

Command: **+PMHF** **V.92 Modem Hook Flash**
Values: N/A
Default: N/A
Description: Causes the DCE to go on-hook for a specified period of time, and then return off-hook for at least a specified period of time. The specified period of time is normally one-half second, but may be governed by national regulations.

Command: **+PQC=n** **Quick Connect Control**
Values: n = 0, 1, 2, or 3
Default: 3
Description: Controls V.92 shortened Phase 1 and Phase 2 startup procedures (Quick Connect). When line conditions are stable, quick connect results in shortened connect times; however, significant fluctuation in line conditions from call to call can cause longer connect times; thus, it may be advisable to disable quick connect.

+PQC=0	Enables Short Phase 1 and Short Phase 2 (Quick Connect)
+PQC=1	Enables Short Phase 1
+PQC=2	Enables Short Phase 2
+PQC=3	Disables Short Phase 1 and Short Phase 2
+PQC=?	Displays the allowed values
+PQC?	Displays the current value

Command: **+VCID=n** **Caller ID Selection**
Values: n = 0, 1, or 2
Default: 0
Description: Enables Caller ID detection and configures the reporting and presentation of the Caller ID data that is detected after the first ring. The reported data includes the date and time of the call, the caller's name and number, and a message. Set S0=2.

+VCID=0	Disables Caller ID
+VCID=1	Enables Caller ID with formatted data
+VCID=2	Enables Caller ID with unformatted data
+VCID=?	Displays the allowed values
+VCID?	Displays the current value

Command: **+VDR=x, y** **Distinctive Ring Report**
Values: x = 0, 1 Distinctive Ring report control. See description.
y = 0–255 Minimum ring interval in 100 ms units. See description.
Default: 0, 0
Description: Enables reporting of ring cadence information to the DTE and specifies the minimum ring cadence that will be reported.
Report format is one line per silence period and one line per ring period. The length of the silence period is in the form DROF=number in units of 100 ms<CR><LF>, and the length of the ring is in the form DRON=number in units of 100 ms<CR> <LF>. The modem may produce a Ring event code after the DRON message if enabled by the y parameter. The *y* parameter must be set to a value equal to or smaller than the expected ring cadence in order to pass the report to the DTE.

+VDR=0, N/A	Disables Distinctive Ring cadence reporting.
+VDR=1, 0	Enables Distinctive Ring cadence reporting. Other call progress result codes (including RING) are reported as normal.
+VDR=1, >0	Enables Distinctive Ring cadence reporting. RING result code is reported after falling edge of the ring pulse (after the DRON report).
+VDR=?	Displays the allowed values.
+VDR?	Displays the current value.

Command: **#CBAn** **Callback Attempts**
Values: n = 1–255
Default: 4
Description: Sets the number of callback attempts that are allowed after passwords have been exchanged between modems.

Command: **#CBDn** **Callback Delay**
Values: n = 0–255
Default: 15
Description: Sets the length of time (in seconds) that the modem waits before calling back the remote modem.

Command: **#CBF?** **Callback Failed Attempts Display**
Values: N/A
Default: N/A
Description: Requests the number of failed callback passwords since reset or power-up. This number can be stored to nonvolatile memory using the &W command.

Command: **#CBFR** **Callback Failed Attempts Reset**
Values: N/A
Default: N/A
Description: Resets the number of failed callback passwords to 0. This does not reset the number stored in nonvolatile memory.

Command: **#CBIn** **Local Callback Inactivity Timer**
Values: n = 1–255
Default: 20
Description: Sets the time (in minutes) that the modem waits for a command before forcing the user to enter the setup password again.

Command: **#CBNy=x** **Store Callback Password**
Values: y = 0–29
x = password
Defaults: None
Description: Sets the callback security password for the y memory location. The password must have 6 to 10 characters, and cannot include the + or - characters.

Command: **#CBPn** **Callback Parity**
Values: n = 0, 1, or 2
Default: 0
Description: Sets parity for the callback security messages.
#CBP0 No parity.
#CBP1 Odd parity.
#CBP2 Even parity.

Command: **#CBRy** **Callback Security Reset**
Values: y = 0–29
Default: None
Description: Clears the password and phone number in the y memory location.

Command: **#CBSn** **Callback Enable/Disable**
Values: n = 0, 1, 2, or 3
Default: 0
Description:
#CBS0 Disables callback security.
#CBS1 Enables local and remote callback security.
#CBS2 Enables remote callback security only.
#CBS3 Disables callback security until local hang-up or reset.

Command: **#Pn** **Set 11-bit Parity**
Values: n = 0 or 1
Default: 2
Description:
#P0 No parity.
#P1 Odd parity.
#P2 Even parity.

Command: **#Sx** **Enter Setup Password**
Values: x= password (1–8 characters, case sensitive)
Default: MTSMODEM
Description: Enters the callback security setup password.

Command: **#S=x** **Store Setup Password**
Values: x= password (1–8 characters, case sensitive)
Default: MTSMODEM
Description: Stores a new callback security and remote configuration setup password.

S-Registers

Certain modem values, or parameters, are stored in memory locations called S-Registers. Use the **S** command to read or to alter the contents of S-Registers (see previous section).

Register	Unit	Range	Default	Description
S0	1 ring	0, 1–255	1	Sets the number of rings until the modem answers. ATS0=0 disables auto answer completely.
S1	1 ring	0–255	0	Counts the rings that have occurred.
S2	decimal	0–127 128–255	43 (+)	Sets ASCII code for the escape sequence character. Values greater than 127 disable escape.
S3	decimal	0–127	13 (^M)	Sets the ASCII code for the carriage return character.
S4	decimal	0–127	10 (^J)	Sets the ASCII code for the line feed character.
S5	decimal	0–32 33–127	8 (^H)	Sets the ASCII code for the backspace character. Values greater than 32 disable backspace.
S6	seconds	2–65*	2*	Sets the time the modem waits after it goes off-hook before it begins to dial the telephone number.
S7	seconds	35-65*	50*	Sets the time the modem waits for a carrier signal before aborting a call. Also sets the wait for silence time for the @ dial modifier.
S8	seconds	0–65	2	Sets the length of a pause caused by a comma character in a dialing command.
S9	decimal	0, 1–127	37 (%)	Sets ASCII code for remote configuration escape character. **S9=0** disables remote configuration.
S10	100 ms	1–254	20	Sets how long a carrier signal must be lost before the modem disconnects.
S11	1 ms	50–150*	95*	Sets spacing and duration of dialing tones.
S28	decimal	0, 1–255	1	0 disables, 1–255 enables V.34 modulation.
S30	1 minute	0, 1–255	0	Sets the length of time that the modem waits before disconnecting when no data is sent or received. A value of zero disables the timer. See also the **\T** command
S35	decimal	0–1	1	0 disables, 1 enables the V.25 calling tone, which allows remote data/fax/voice discrimination.
S36	decimal	0–7	7	Specifies the action to take in the event of a negotiation failure when error control is selected. (See **S48**.)

S37	decimal	0–19	0	Sets the maximum V.34 “upstream” speed at which the modem attempts to connect. 0 = maximum speed 1 = reserved 2 = 1200/75 bps 3 = 300 bps 4 = reserved 5 = 1200 bps 6 = 2400 bps 7 = 4800 bps 8 = 7200 bps 9 = 9600 bps 10 = 12000 bps 11 = 14400 bps 12 = 16800 bps 13 = 19200 bps 14 = 21600 bps 15 = 24000 bps 16 = 26400 bps 17 = 28800 bps 18 = 31200 bps 19 = 33600 bps
S38	decimal	0–23	1	Sets “downstream” data rate where V.90 provides rates of 28,000 to 56,000 bps in increments of 1,333 bps. 0 = V.90 disabled 1 = V.90 auto rate 2 = 28,000 bps 3 = 29,333 bps 4 = 30,666 bps 5 = 32,000 bps 6 = 33,333 bps 7 = 34,666 bps 8 = 36,000 bps 9 = 37,333 bps 10 = 38,666 bps 11 = 40,000 bps 12 = 41,333 bps 13 = 42,666 bps 14 = 44,000 bps 15 = 45,333 bps 16 = 46,666 bps 17 = 48,000 bps 18 = 49,333 bps 19 = 50,666 bps 20 = 52,000 bps 21 = 53,333 bps 22 = 54,666 bps 23 = 56,000 bps **Upstream data rates:** Upstream V.90 data rates are 4800 to 33,600 bps in 2400 bps increments.
S43	decimal	0–1	1	For testing and debugging only. Enables/disables V.32bis start-up auto mode operation. 0 = disable; 1 = enable.

S48 decimal 7 or 128 7

Enables (7) or disables (128) LAPM negotiation. The following table lists the **S36** and **S48** configuration settings for certain types of connections.

	S48=7	**S48=128**
S36=0, 2	LAPM or hang up	Do not use
S36=1, 3	LAPM or async	Async
S36=4, 6	LAPM, MNP, or hang up	MNP or hang up
S36=5, 7	LAPM, MNP, or async	MNP or async

S89 seconds 0, 5–255 10

Sets the length of time in the off-line command mode before the modem goes into standby mode or "sleep mode". A value of zero prevents standby mode; a value of 1–4 sets the value to 5. Standby mode (sleep mode or low power mode) is controlled by **S89**. It programs the number of seconds of inactivity before the modem will go to sleep. The default value is 0. A value of 0 disables standby mode. The modem will wake on an incoming ring or an AT command.

S108 decimal 0–3, 6, 7 6

Selects the 56K digital loss if using the modem through a PBX line. The default value is -6 dB loss, the value used when calling from a typical POTS line long distance.

0 = -0 dB digital loss, no robbed-bit signaling
1 = -3 dB PBX digital loss
2 = -2 dB digital loss
3 = -3 dB digital loss
6 = -6 dB digital loss
7 = -0 dB digital loss with robbed-bit signaling

Result Codes

In command mode your modem can send responses called **Result Codes** to your computer. Result codes are used by communications programs and can also appear on your monitor.

Terse	Verbose	Description
0	OK	Command executed
1	CONNECT	Modem connected to line
2	RING	Ring signal detected
3	NO CARRIER	Carrier signal lost or not detected
4	ERROR	Invalid command
5 *	CONNECT 1200	Connected at 1200 bps
6	NO DIALTONE	No dial tone detected
7	BUSY	Busy signal detected
8	NO ANSWER	No answer at remote end
9	CONNECT 75	Connected at 75 bps
10*	CONNECT 2400	Connected at 2400 bps
11*	CONNECT 4800	Connected at 4800 bps
12*	CONNECT 9600	Connected at 9600 bps
13*	CONNECT 14400	Connected at 14400 bps
14*	CONNECT 19200	Connected at 19200 bps
18	CONNECT 57600	Connected at 57600 bps
24*	CONNECT 7200	Connected at 7200 bps
25*	CONNECT 12000	Connected at 12000 bps
28	CONNECT 38400	Connected at 38400 bps
40*	CONNECT 300	Connected at 300 bps
55*	CONNECT 21600	Connected at 21600 bps
56*	CONNECT 24000	Connected at 24000 bps
57*	CONNECT 26400	Connected at 26400 bps
58*	CONNECT 28800	Connected at 28800 bps
59*	CONNECT 31200	Connected at 31200 bps
60*	CONNECT 33600	Connected at 33600 bps
70	CONNECT 32000	Connected at 32000 bps
71	CONNECT 34000	Connected at 34000 bps
72	CONNECT 36000	Connected at 36000 bps
73	CONNECT 38000	Connected at 38000 bps
74	CONNECT 40000	Connected at 40000 bps
75	CONNECT 42000	Connected at 42000 bps
76	CONNECT 44000	Connected at 44000 bps
77	CONNECT 46000	Connected at 46000 bps
78	CONNECT 48000	Connected at 48000 bps
79	CONNECT 50000	Connected at 50000 bps
80	CONNECT 52000	Connected at 52000 bps
81	CONNECT 54000	Connected at 54000 bps
82	CONNECT 56000	Connected at 56000 bps
83	CONNECT 58000	Connected at 58000 bps
84	CONNECT 60000	Connected at 60000 bps
86	CONNECT 16800	Connected at 16800 bps
87	CONNECT 115200	Connected at 115200 bps
88	DELAYED	Delay is in effect for the dialed number
89	BLACKLISTED	Dialed number is blacklisted
90	BLACKLIST FULL	Blacklist is full
91	CONNECT 230400	Connected at 230400 bps
100	CONNECT 28000	Connected at 28000 bps
101	CONNECT 29333	Connected at 29333 bps
102	CONNECT 30666	Connected at 30666 bps
103	CONNECT 33333	Connected at 33333 bps
104	CONNECT 34666	Connected at 34666 bps
105	CONNECT 37333	Connected at 37333 bps
106	CONNECT 38666	Connected at 38666 bps
107	CONNECT 41333	Connected at 41333 bps
108	CONNECT 42666	Connected at 42666 bps
109	CONNECT 45333	Connected at 45333 bps
110	CONNECT 46666	Connected at 46666 bps
111	CONNECT 49333	Connected at 49333 bps
112	CONNECT 50666	Connected at 50666 bps
113	CONNECT 53333	Connected at 53333 bps

114	CONNECT 54666	Connected at 54666 bps
115	CONNECT 25333	Connected at 25333 bps
116	CONNECT 26666	Connected at 26666 bps

*EC is added to these result codes when the extended result codes configuration option is enabled. EC is replaced by one of the following codes, depending on the type of error control connection:

V42bis – V.42 error control (LAP-M) and V.42bis data compression
V42 – V.42 error control (LAP-M) only
MNP5 – MNP 4 error control and MNP 5 data compression
MNP4 – MNP 4 error control only
NoEC – No error control protocol).

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